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Amino acid sequenc
Streptococcus poly
Streptococcus poly
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Human ORFX protein
Herbicidally activ
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Lactococcus lactis
Enterococcus faeca
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AAG38914	AAG38915	AAW20772	AAU83013	4	44	AAY44286	AAY44285	AAY44279	AAY44280	AAY74903	ABB62191	AAY74906	ABP29822	ABP27680	AAY74907	AAY74904	AAB69070	AAG51259	AAG51260	AAG51261	AAM79969	AAM78985	ABG24227	AAB28151	ABB72256	AAB56056	AAY76117	AAB61239	AAW96702	71	749	96	Y27	ABB49111
	abidopsi	H. pylori cytoplas	homo	A20	A20	A20	A20		A20	D)	Drosophila melanog	Neisseria meningit	Streptococcus poly		eria	Neisseria meningit		Arabidopsis thalia	Arabidopsis thalia	Arabidopsis thalia	protei	n protei	l human dia	t protein	rotei	n cell	it homo	Slit-1 prot	length slit-	n slit-2 prot	n Slit-	like	an	Listeria monocytog

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ALIGNMENTS

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RESULT 1
AAW06577
     Transfer of at least 2 saccharide units using poly:glycosyl:transferase - isolated from N. gonorrhoeae, catalyses the addition of both GlcNac and GalNac di:saccharide(s) units to a
                                              WPI; 1997-052351/05.
N-PSDB; AAT49230.
                                                                                                                                                                                                                                          Polyglycosyltransferase; N-acetylglucosaminyl transferase; N-acetylgalactosaminyl transferase; lipo-oligosaccharide.
                                                                                                                                                                                                                                                                                                                                                 AAW06577 standard; Protein; 126
                                                                                 Buczala SL,
                                                                                                                             07-JUN-1995;
                                                                                                                                                    03-JUN-1996;
                                                                                                                                                                                                 WO9640971-A1.
                                                                                                                                                                                                                      Neisseria gonorrhoeae ATCC 33084.
                                                                                                                                                                                                                                                                             Lipo-oligosaccharide gene-encoded protein.
                                                                                                                                                                                                                                                                                                       21-MAR-1997
                                                                                                                                                                                                                                                                                                                              AAW06577;
                                                                                                      (NEOS-) NEOSE TECHNOLOGIES INC
                                                                                                                                                                            19-DEC-1996
                                                                                                                                                                                                                                                                                                      (first entry)
                                                                                 Johnson KF, Roth S;
                                                                                                                             95US-0478140.
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RESULT 2
ABB54412
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Best Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 stated in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   single galactose moiety
                                                  The present invention is related to a Lactococcus lactis nucleotide sequence (ABA90521) and related proteins (ABB3300-ABB55621). The nucleic acid sequence is useful in the detection and/or amplification nucleic acid sequence, particularly to identify Lactococcus lactis or related species. The proteins of the invention are useful for the biosynthesis or biodegradation of a composition of interest. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
             invention helps research in lactic bacteria, particularly useful production of yogurt and cheese.

Note: The sequence data for this patent is based on equivalent patent is based on equivalent patent.
                                                                                                                                               Claim 6; SEQ ID No 1114; 2504pp; French
                                                                                                                                                                                                                                          Bolotine
                                                                                                                                                                                                                                                                                            11-APR-2000;
                                                                                                                                                                                                                                                                                                                      11-APR-2000;
                                                                                                                                                                                                                                                                                                                                               12-OCT-2001.
                                                                                                                                                                                                                                                                                                                                                                                                  Lactococcus lactis IL1403
                                                                                                                                                                                                                                                                                                                                                                                                                         Biosynthesis; biodegradation; lactic bacterium; yogurt; cheese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Lactococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             16-MAY-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ABB54412
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ABB54412 standard; Protein;
  WO200177334
                                                                                                                                                                                                                                                                  (INRG )
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                                                                                                                                                                       nucleotide sequence useful in tis and related species -
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  (published 18-OCT-2001) which is available in electronic
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
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                                                                                                                                                                                                                                                                                                                      2000FR-0004630
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                                                                      genes, their use in the discovery of novel antibiotics, the essential genes themselves and the encoded proteins. The prokaryotes used are gscherichia coli, Staphylococcus aureus, Salmonella typhi, Klebsiella pneumoniae, Pseudomonas aeruginosa and Enterococcus faecalis. The invention is also useful for the identification of potential new targets for antibiotic development. The antisense nucleic acids can also be used to identify proteins used in proliferation, to express these proteins, and to obtain antibodies capable of binding to the expressed proteins. The proteins can be used to screen compounds in rational drug discovery.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
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                                                                                                                                                                                                                                                                                                                        The invention relates to antisense inhibitors of genes essential to prokaryotic cellular proliferation, their use in identifying the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI; 2001-611495/70.
N-PSDB; AAS51260.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Haselbeck R, Yamamoto RT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        27-NOV-2000;
22-DEC-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 21-MAR-2000;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Antisense;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Enterococcus
                                                                                                                                                                                                                                                                                                                   prokaryotic cellular proliferation,
                                                                                                                                                                                                                                                                                                                                                                                                    Example 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (ELIT-) ELITRA PHARM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23-OCT-2000;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         23-MAY-2000;
                                                   programmes. The antisense nucleic acid sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 575 NLVKKA-KDIKEINPTLFEEDAEEALYNVVISLQNQWTYMPGEEKFRAIVHSLA---PAI 630
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homologous nucleic acids which are required ide variety of organisms. The present sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                  polynucleotides for the identification and development lbiotics, comprise sequences of antisense nucleic acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPKIAAAVAEGNFRTALSELASVKPQV 84
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ETFFESVMVMAEDLSVRDNRIALLSEVVALTSVMADFSLI
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 standard; Protein; 989
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       prokaryotic cellular
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           672 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               antibacterial;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
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2000US-242578P.
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2000US-257931P
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ohlsen
Xu HH;
                                                                                                                                                                                                                                                                                                                                                                                                    ID No 4897;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27.4%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Zyskind JW,
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design.
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J. No. 9.6e-09;
                                                                                                                                                                                                                                                                                                                                                                                                    English.
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                                for cell proliferation
                                                           is also useful to screen
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RESULT 4
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Best Local S
Matches 46
           This sequence represents the glycyl trNA synthetase (glyS) beta subunit from Streptcocccus pneumoniae 010093 (NCIMB 40794). The polynucleotide encoding glyS can be used for the recombinant production of glyS, which can be used to treat conditions requiring glyS activity. Sequences antisense to the polynucleotide can be used to control glyS expression. GlyS, or glyS expressing vectors can be used to induce an immune response, i.e. an antibody (Ab) and/or T cell response, against S. pneumoniae to protect against infection, or to screen for antagonists or agonists of the polynucleotide encoding glyS or glyS's activity, i.e. antibacterials. The antagonist, e.g. an anti-glyS Ab, can used to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Note: The sequence data for this patent did not join pure of the printed specification, but was obtained in electronic format directly from WIPO at
                                                                                                                                                                                                                                                                                                                                  (SMIK )
treat conditions requiring glyS inhibition,
                                                                                                                                                                          Claim
                                                                                                                                                                                                               DNA encoding glycyl tRNA synthetase useful for diagnosis, treatment and
                                                                                                                                                                                                                                                                         WPI; 1997-526209/48
                                                                                                                                                                                                                                                                                                       Lawlor
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Glycyl tRNA synthetase beta; glyS beta polypeptide; immune response; vaccine; antibacterial; meningitis; bacterial infection.
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46; Conser
                                                                                                                                                                                                                                                                                                                                  SMITHKLINE SMITHKLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          prokaryotic cellular proliferation protein. sequence data for this patent did not form
                                                                                                                                                                         Page 40-42;
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                                                                                                                                                                                                     especially meningitis
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BEECHAM PLC.
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Pred. No. 2e-08;
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                                                                                                                                                                                                                 of Streptococcus pneumoniae prevention of bacterial
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RESULT 5
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       encoding glyS can used as a probe to isolate full length or related sequences, or diagnose, e.g. by polymerase chain reaction, infection stage and type, including mutation and polymorphism detection. Diagnosis may also be achieved by detecting glyS gene overexpression, e.g. by immunoassay. The Ab can used to treat infection, isolate or identify glyS expressing clones, purify glyS and as an immunoassay reagent. More generally, the products can prevent adhesion of bacteria to wounds and in dwelling devices, block glyS protein mediated invasion of mammalian cells and block the normal progression of infection.
                                                                                                            polypeptides - useful for producing re
screening for antibacterial compounds,
                                                                                                                                                                WPI; 1998-321534/28
N-PSDB; AAV31656.
                                                                                                                                                                                                                                                                                                                                                                     Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                               Glycyl tRNA antagonist;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VFKQLPEAAALAAANK-------RVQNLLKKADAALGEVNESLLQQDEEKALYAA 53
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               l Similarity
43; Conserv
                                                                                                                                                                                                                            SMITHKLINE SMITHKLINE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            particularly meningitis. A fragment of the polynucleotide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   678 AA;
                                                                                                                                                                                                                                                                                                                                                                                               antibacterial activity
                                                                                                                                                                                                                                                                                                                                                                                                           synthetase-beta gene; glyS-beta; vaccine; agonist;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                        pneumococcal glycyl tRNA synthetase subunit - useful for producing recombinant polypept
                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
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                                                                                                                                                                                                                             BEECHAM CORP.
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35.5%;
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Pred. No. 2e-08;
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                                                                                                              in DNA vaccines
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This is the amino acid sequence of the Streptomyces pneumoniae novel glycyl tRNA synthetase-beta (glyS-beta) protein. The polynucleotides are useful for producing the recombinant polypeptides, which can be used in vaccines or to screen for glyS-beta or glyS-alpha agonists or antagonists with potential antibacterial activity. The polynucleotides are also useful for DNA vaccination.

Claim 1; Columns 7-8; 24pp; English

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RESULT 6
ABP26830
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24-NOV-2000;
07-MAR-2001;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Streptococcus; GAS; GBS; group B streptococcus; Streptococcus agalactiae; group A streptococcus; Streptococcus pyogenes; antibacterial; antiinflammatory; infection; vaccine; meningitis; gene therapy.
             streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GAS (Streptococcus/GAS (Streptococcus/GAS), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABN66044-ABN1526 and antibodies that bind (I) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptococcus in a biological sample. (I) is used to determine whether a compound binds to (I). A composition comprising (I) or a nucleic acid encoding (I), may be
                                                                                                                                                                                            New Streptococcus protein for the treatment or prevention of info or disease caused by Streptococcus bacteria, such as meningitis, for detecting a compound that binds to the protein -
                                                                                                                                                                                                                                                                                                   Telford J,
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                                                                                                                                                                       Claim 1;
                                                                                                                                                                                                                                                  N-PSDB;
                                                                                                                                             The invention
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  as a vaccine or diagnostic
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                                                                                                                                                                                                                                                                                                  Masignani V,
                                                                                                                                                                                                                                                                                                                                                                 ; 2000GB-0026333.
; 2000GB-0028727.
; 2001GB-0005640.
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                                                                                                                                            relates to a protein (ABP25413-ABP30895) from group
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Pred. No. 2
                                                                                                                                                                       English.
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24-NOV-2000;
07-MAR-2001;
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The invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GAS (Streptococcus pyogenes), comprising one of 5483 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABN66044-ABN71256 and antibodies that bind (I) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by
                                                                                                                                                                                                                                                                New Streptococcus protein for the treatment or prevention of infection or disease caused by Streptococcus bacteria, such as meningitis, and for detecting a compound that binds to the protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Streptococcus agalactiae
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DB; ABN67460.
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Pred. No. 1.1e-07;
5; Mismatches 37;
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The invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agailactiae) or group A streptococcus/GBS (Streptococcus agailactiae) or group A streptococcus/GBS (Streptococcus proteins acquences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABN66044-ABN71526 and antibodies that bind (I) are used in the manufacture of medicaments for
                                                                                                                                                                                                                                                                          New Streptococcus protein for the treatment or prevention of infection or disease caused by Streptococcus bacteria, such as meningitis, and for detecting a compound that binds to the protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Streptococcus; GAS; GBS; group B streptococcus; Streptococcus agalactiae; group A streptococcus; Streptococcus pyogenes; antibacterial; antiinflammatory; infection; vaccine; meningitis; gene therapy.
                                                                                                                                                    The invention relates to a protein (ABP25413-ABP30895) from
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24-NOV-2000; 2000GB-0028727.
07-MAR-2001; 2001GB-0005640.
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Tettelin H;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ABP28806;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ABP28806 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (GENO-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  02-MAY-2002.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (CHIR-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             22 RVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPKIAAAVAEGNFRTALSELASVK 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ω
                                                                                                                                                                                                                                                                                                                                                                                                2002-352536/38.
DB; ABN69437.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          POVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVADIALL 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RAFNLAEKVTHSV-LVDSSLFENNQEKALYQAILSLE-----LTEDMHDNLDKLFALS 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CHIRON SPA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                            Page 3841; 4525pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 100 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Masignani V,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GENOMIC RES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (first entry)
                                                                                                                                                                                                                                                                    a compound
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                                                                                                                                                                                                                                                                       that binds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Margarit Ros YI,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           18;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    679
                                                                                                                                                                                                            English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 135;
Pred. No. 9.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ID NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
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                                                                                                                                                                                                                                                                    protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Grandi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  97
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptococcus in a biological sample. (I) is used to determine whether a compound binds t (I). A composition comprising (I) or a nucleic acid encoding (I), may used as a vaccine or diagnositic composition. The disease caused by Streptococcus that is prevented or treated may be meningitis. Nucleic acid encoding (I) may be used to recombinantly produce (I) and may be used in gene therapy. Antibodies to (I) are used for affinity cohromatography, immunoassays, and distinguishing/identifying
                                                                                                                                                                            Novel human polypeptides and polynucleotides useful for diagnosing preventing and treating cardiovascular disease, neurodegenerative, hyperproliferative disorders and autoimmune disorders -
                                                                                                                                                                                                                                                                                                   N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           30-MAY-2000;
29-AUG-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   hyperproliferative disorder; psoriasis; benign tumour; haemorrhage degenerative disorder; osteoarthritis; neurodegenerative disorder; cardiovascular disease; diabetes mellitus; systemic lupus erythema
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Human; open reading frame; ORFX; gene therapy; cancer; hyperproliferative disorder; psoriasis; benign tumour;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Streptococcus proteins.
                                                                                                                       Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 29-MAY-2001; 2001WO-US10836.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            06-DEC-2001.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WO200192523-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        myasthenia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      autoimmune
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Human ORFX protein sequence SEQ ID NO:14812.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    24-JUN-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ABP07415;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ABP07415 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hypertension; hypothyroidism; cholesterol ester storage disease; immune deficiency; immune disorder; infectious disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                 (CURA-) CURAGEN CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         634 PIINDFFDNTMVMTDDEKMKQNRLAILNSLVAKARTVAAFNLL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           582 RAFNLAEKVTHSV-LVDSSLFENNQEKALYQAILSLE------LTEDMHDNLDKLFALS 633
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  22 RVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPKTAAAVAEGNFRTALSELASVK 81
                                                                                                                                                                                                                                                                                                                               2002-106308/14.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVADIALL
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                                                                                                                                                                                                                                                                                                   ABN23167
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                         RA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gravis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   disorder;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  679 AA;
                                                                                                                       SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000US-206132P.
2000US-228716P.
                                                                                                                                                                                                                                                                                                                                                                                         Leach
                                                                                                                    ID 14812;
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Ö;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   rheumatoid
                                                                                                                 1037pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             18;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                arthritis; autoimmune
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                    English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         676
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 cirrhosis;
haemorrhage;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         erythematosus;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             8
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2
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The present invention describes substantially purified human (referred to as open reading frame, ORFX, where X is 1-11491 in the specification). ABN15762 to ABN27252 encode the human

(see proteins

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RESULT 10
ABB92588
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           밁
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 bone degenerative disorders, or periodontal disease, and for gut protection or regeneration and treatment of lung or liver fibrosis, reperfusion injury in various tissues and conditions resulting from systemic cytokine damage.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          diseases, autoimmune disorders such as multiple sclerosis, rheumatoid arthritis, autoimmune thyroiditis, myasthenia gravis, graft-versus-host disease and autoimmune inflammatory eye disease. ORFX proteins are also
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 sequences can be used in gene therapy. ORFX sequences can be used in the treatment of cancer, hyperproliferative disorders, cirrhosis of liver, psoriasis, benign tumours, keloid, degenerative disorders, haemorrhage, osteoarthritis, neurodegenerative disorders, disorders related to organ transplantation, cardiovascular diseases, diabetes mellitus, systemic lupus erythematosus, hypertension, hypothyroidism, cholesterol ester
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    treating or preventing a pathology associated with an ORFX-associated disorder in humans, and in the manufacture of a medicament for treatin syndrome associated with ORFX-associated disorder. ORFX polynucleotide
                                                                                                               Identifying plant target proteins for herbicidally active compounds, comprising aligning and comparing nucleic acid or amino acid sequence from plant with nucleic acid or amino acid sequences from non-plant
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lupus erythematosus, hypertension, hypothyroidism, cholestenstorage disease, various immune deficiencies and disorders,
                               Claim 5; SEQ ID NO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    specification,
                                                                                                                                                                                                                                               WPI; 2002-269010/31.
                                                                                                                                                                                                                                                                                                            Tietjen K,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WO200210210-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Arabidopsis thaliana
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ABB92588;
                                                                                                                                                                                                                                                                                                                                                                         (FARB ) BAYER AG
                                                                                                                                                                                                                                                                                                                                                                                                                                  28-AUG-2001; 2001WO-EP09892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            28-AUG-2001; 2001WO-EP09892
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            07-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Herbicidal; plant; agriculture; herbicide
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Herbicidally active polypeptide SEQ ID NO 1799.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  31-MAY-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ABB92588 standard; Protein; 1067
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LARLATLREPVDAFFEAVMI
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1 Similarity
33; Conserv
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                                                                                                                                                                                                                                                                                                            Weidler
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Pred. No. 1.4e-06;
4; Mismatches 32;
                         Sequence Listing; English
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Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            aligning and comparing nucleic acid or amino acid sequences from plant with nucleic acid or amino acid sequences from non-plant organisms using suitable search parameters, where plant sequences having an E-value greater by a factor of 3 than the E-value of most similar non-plant sequences are selected. The polypeptides or nucleic acids encoding them are useful for identifying modulators. The identified modulators are
                                                                                                                                               Genomic sequence for Listeria monocytogenes, useful e.g. and prevention of Listeria and related bacterial infection
                                                                                                                                                                                                                                      Buchrieser C, Frangeul L, Couve E, Rusniok C, Fsihi H, Dehoux J Bussurget O, Chetouani F, Nedjari H, Glaser P, Kunst F, Cossari Daniels J, Goebel W, Kreft J, Kuhn M, Ng E, Vazquez-Poland JA; Dominguez-Bernal G, Garrido-Garcia P, Tierrez-Martinez A, Amend J, Chakraborty T, Domann E, Hain T, Berche P, Charbit A, Durant L, Perez-Diaz J, Baguero F, Garcia Del Portillo F, Gomez-Lopez N; Maduenio E, De Pablos B, Wehland J, Kaerst U, Entian K, Hauf J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         1018 MQL--VEPLED-FFNNVFVMVEEERVRKNRLALLNNIANLPKGVIDLSFL 1064
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   useful as herbicides.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     The invention relates to identifying target proteins (ABB90790-ABB94016) for herbicidally active compounds, comprising
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Antibacterial; gene therapy; vaccine; biosynthesis; biodegradation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     05-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ABB49111;
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                                                                                                      Claim 6;
                                                                                                                                                                                               WPI; 2002-010914/01.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  WO200177335-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Listeria monocytogenes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           vitamin B12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Listeria monocytogenes protein #1815
                                                                                                                                                                                                                                                                                                                                                             (INSP ) INST PASTEUR.
                                                                                                                                                                                                                                                                                                                                                                                                                       11-APR-2001; 2001WO-FR01118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  958 IVEAYSRPTRIVRGKDVGVGVEVLENAFETPQERTLWSTYTSIKDRIHTGIEIEDFTEIS 1017
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  75 SELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVADIALL 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             16 LAAANKRVQNLLKKADAALG-EVNESLLQQDEEKALYAAAQGLQPKIAAAVAEGNFRTAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            32;
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                                                                                                     SEQ ID No
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           bacterial infection; disease
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                                                                                                      1816;
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29.1%;
                                                                                                   192pp;
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Pred. No. 0.
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monocytogenes EGD-e (see ABA03041). The genome sequence and fragments it are useful for selecting probes and primers for detecting genes in monocytogenes and related organisms, and for studying genetic polymorphisms and other genomes. The present sequence is a protein encoded by the genome sequence of the present invention. Proteins

The present invention relates to the genome sequence of Listeria

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                           vertebrate slit proteins encoding nucleic acid sequences have at least 60% homology to nucleic acid sequences AAX89161-163. The vertebrate-derived proteins can be produced recombinantly by transforming host cells with expression vectors comprising the encoding nucleic acids. The proteins of the invention are for diagnosing and treating cancer of the nerves, muscle and/or endocrine system.
                                                                                                                     The invention relates to a vertebrate-derived protein containing an amino acid sequence shown in AAY27137 and AAY27139. The vertebrate-derived protein has at least 55 % homology to one of sequences shown in AAY27141-Y27143, and has slit protein-like activity. The
                                                                                                                                                                                                        Claim
                                                                                                                                                                                                                                    New vertebrate slit protein - cancers in nerves, muscle and
                                                                                                                                                                                                                                                                                                    WPI; 1999-411830/35
                                                                                                                                                                                                                                                                                                                                                                05-DEC-1997;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Vertebrate-derived protein; muscle; endocrine system.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human slit-2 mature protein
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 monocytogenes and related organisms
                                                                                                                                                                                                                                                                                                                                 (ASAH ) ASAHI KASEI KOGYO KK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15-SEP-1999
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                                                                                                                                                                                                   Page 43-47; 102pp; Japanese
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Pred. No. 0.025; 
23; Mismatches 4
                                                                                                                                                                                                                                  useful for diagnosis and treatment endocrine system
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                                                                                                                                                                                                      The present sequence represents the mature protein sequence a slit-like polypeptide. The polypeptide is useful for the diagnosis and the treatment of all nervous diseases, thyroic
                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                      Claim 1; Page 17-21; 50pp; Japanese
                                                                                                                                                                                                                                                                              New slit-like polypeptide \boldsymbol{\cdot} useful for diagnosis and nervous, thyroid, adrenal and muscular diseases
                                                                                                                                                                                                                                                                                                                     WPI; 1999-161084/14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Slit-like polypeptide; diagnosis; treatment; nervous disease;
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                                                                                                                                                                                                                                                                                                                                         (ASAH ) ASAHI KASEI KOGYO KK
                                                                                                                                                                                                                                                                                                                                                                                          09-JUL-1997;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                Homo sapiens
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115 MNAVADIALLGE
                                                                      522 LEATGIFKKLPQLRKINFSNNKITDIEEGAFEGASGVNEILLTSNRLENVQHKMFKGLE- 580
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                                                                                             LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDE-EKALYAAAQGLQP 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIKTIMIRSNRITCYGNDSFIGISSYR-LISIYDNQITTYAPGAFDTIHSISTINIIANP 639
                                              KIAAAVAEGNFRTALSE-----LASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQ 114
                       SLKTLMLRSNRITCYGNDSFIGLSSVR-LLSLYDNQITTVAPGAFDTLHSLSTLNLLANP 639
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KIAAAVAEGNERTALSE-----LASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQ 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LEATGIFKKLPQLRKINFSNNKITDIEEGAFEGASGVNEILLTSNRLENVQHKMFKGLE- 580
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                                                                                                                                                                                             adrenal diseases and muscular diseases
                                                                                                                                                                      1503 AA;
                                                                                                                      Conservative
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                                                                                                                                                                                                                                                                                                                                                                    97JP-0183683
                                                                                                                                                                                                                                                                                                                                                                                          97JP-0183683.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        adrenal disease;
 126
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Pred. No.
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Pred. No.
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RESULT 14
AAX17499
ID AAX177499
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RESULT 15
AAY27145
ID AAY27145 standard; protein; 1529 AA.
                                                                                                                                                    В
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The present sequence is the human Slit-1 protein. The present invention also describes a method for identifying agents which modulate the interaction of Robo and a Robo ligand comprising: combining a Robo golypeptide, a Slit polypeptide and a candidate agent under conditions where the Robo and Slit polypeptides normally (but for the presence of the agent) engage in a first interaction, where the Slit polypeptide goes grecifically binds, activated or inhibits the activation of the Robo golypeptides in the presence of the agent, where a difference between the first and second interaction of the Robo and Slit polypeptides; and a second interaction of the Robo and Slit polypeptides; and a method to modulate the interaction of Robo and Slit polypeptides; and a method to modulate consideration for Robo (roundabout) modulators and Robo:Slit complexes are useful for regulating various cell functions, especially of neuronal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match.
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14-NOV-1997;
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                                                                                                                                                                                                                                                                      SLKTLMLRSNRITCVGNDSFIGLSSVR-LLSLYDNQITTVAPGAFDTLHSLSTLNLLANP
                                                                                                                                                                                                                                                                                                                              KIAAAVAEGNFRTALSE-----LASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQ 114
                                                                                                                                                                                                                                                                                                                                                                                        LEATGIFKKLPQLRKINFSNNKITDIEEGAFEGASGVNEILLTSNRLENVQHKMFKGLE- 602
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97US-0065544.
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Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY27145;
                                                                                                                                                                                                                                                                                                                                    The invention relates to a vertebrate-derived protein containing an amino acid sequence shown in AAY27137 and AAAZ7139. The vertebrate-derived protein has at least 55 % homology to one of sequences shown in AAY27141-Y27143, and has slit protein-like activity. The vertebrate slit proteins encoding nucleic acid sequences have at least 60% homology to nucleic acid sequences AAX89161-163. The vertebrate-derived proteins can be produced recombinantly by transforming host cells with expression vectors comprising the encoding nucleic acids. The proteins of the invention are for diagnosing and treating cancer of the proteins of the invention are for diagnosing and treating cancer of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           15-SEP-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Disclosure; Page 58-63; 102pp; Japanese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                New vertebrate slit protein - useful for diagnosis and treatment cancers in nerves, muscle and endocrine system
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              N-PSDB; AAX89162
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 1999-411830/35
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                                                                                                                                             KIAAAVAEGNFRTALSE-----LASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQ 114
                                                                                                                                                                                                      LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDE-EKALYAAAQGLQP 59
                                                                                                                                                                          LEATGIFKKLPQLRKINFSNNKITDIEEGAFEGASGVNEILLTSNRLENVQHKMFKGLE-
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                                                                                      MNAVADIALLGE 126
                                                                                                                                                                                                                                      l Similarity
33; Conserv
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4: /cgn2_6/ptodata/1/iaa/6B_COMB.pep:*
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                                                                     Query Match
Best Local Similarity
                                                              Matches 126;
                                                                                                             TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                            SEQUENCE CHARACTERISTICS:
LENGTH: 126 amino acid
61 IAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVAD 120
                                                                                                                                                                                                                                                                                                                                                                    COUNTRY:
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STATE: New Jersey
                               1 LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPK 60
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11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.4	11.4	11.4	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
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US-08-468-718-4	US-08-467-852A-5	US-08-214-222-4	US-08-469-434-4	US-08-072-070-4	US-09-267-747-15	US-08-572-447C-15	US-08-242-677-2	US-09-080-855-2	US-08-936-165A-517	US-08-840-006-5	US-08-840-006-6	US-08-445-135-2	US-08-800-593-13	US-08-317-450B-13	US-08-800-593-15	US-08-317-450B-15	US-09-413-814-32
Sequence 4, Appli	Sequence 5, Appli	Sequence 4, Appli	Sequence 4, Appli	Sequence 4, Appli	Sequence 15, Appl	'Sequence 15, Appl	Sequence 2, Appli	2,	Sequence 517, App		Sequence 6, Appli	Sequence 2, Appli	Sequence 13, Appl	Sequence 13, Appl	•	Sequence 15, Appl	Sequence 32, Appl

ALIGNMENTS

Title:

on:

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ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO: 2:
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GENERAL INFORMATION:
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COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Vc
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING T
NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
ADDRESSEB: Klauber & Jackson
                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: US/08/312,387B FILING DATE: July 7, 1994 CLASSIFICATION: 435
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  Score 598; DB 1;
Pred. No. 3.7e-57;
); Mismatches 0;
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                 US-08-683-458-2
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INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
LENGTH: 126 amino acids
TYPE: amino acid
TOPOLOGY: linear
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Best Local
Sequence 2, Application US/08683458
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
NUMBER OF SEQUENCES: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CLASSIFICATION: 536 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOETWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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ATTORNEY/AGENT INFORMATION:
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                                                                                       IALLGE 126
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N: 536
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RESULT 4
US-08-878-360-2
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                                                                                                                                                                                                   Sequence 2, Application US/08878360 Patent No. 5945322
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Best Local Similarity
Matches 126; Conserv
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                                                                           GENERAL INFORMATION:
APPLICANT: GOLSCHLICH, Emil C.
APPLICANT: GOLSCHLICH, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING T
NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
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CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
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PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 1994
CLASSIFICATION: 435
CLASSIFICATION: 435
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
OPERATING SYSTEM: PC-DOS/MS-DOS
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLICOSACCHARIDES, AND GENES ENCODING THEM
NUMBER OF SEQUENCES: 12
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TELEPHONE: 201 487-5800
TELEFAX: 201 343-1884
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LENGTH: 126 amino acids
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STREET: 411
STREET: 411
STREET: 411
Terse
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                                                             ADDRESSEE:
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                                                             Klauber & Jackson
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ZIP: 07601 COMPUTER READABLE FORM:

MEDIUM TYPE:

Floppy disk

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RESULT 5
US-08-478-140B-2
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; MOLECULE TYPE:
US-08-878-360-2
                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                            Patent No.
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                                                                                                                                                            APPLICANT: ROTH, STEPHEN
APPLICANT: BUCZALA, STEPHANIE L.
APPLICANT: BUCZALA, STEPHANIE L.
TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
NUMBER OF SEQUENCES: 8
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPAX: 201 487-5800
TELEFAX: 201 343-1684
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LENGTH: 126 amino acid
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APPLICATION NUMBER:
FILING DATE:
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                                                                                                        STREET: 1155 A. CITY: New York
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CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICATION NUMBER: US/08/878,360 FILING DATE: 18-JUN-1997
                                                       COUNTRY: USA
ZIP: 10036-2711
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CLASSIFICATION: 435
                                                                                                                                             ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPK 60
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Pred. No. 3.7e-57;
Nismatches 0; Indels
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RESULT 6
US-09-333-412-2
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Best Local Similarity
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REFERENCE/DOCKET NUMBER: 7188
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 790-9090
TELEFAX: (212) 869-9741/8864
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
LENGTH: 126 amino acid
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APPLICATION NUMBER: US,
FILING DATE: 07-JUN-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTORNEY/AGENT NAME: Laura
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SOFTWARE: PatentI
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REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
                                                                                 APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                APPLICATION NUMBER: US/09/33,412
FILING DATE: 15-Jun-1999
CLASSIFICATION: <Unknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                             COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF OLIGOSACCHARIDES, AND GENES ENCODING THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Gotschlich, Emil C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   IAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVAD 120
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                                                                                                                                                                                                                                                                                                                                                                          STATE: New Jersey COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                STREET: 411 Hackensack Avenue CITY: Hackensack
                                            NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742
                                                                                                                                                                                                                                                                                                                                                       ZIP: 07601
                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE: Klauber & Jackson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            126 amino acids
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PatentIn Release #1.0, Version #1.30
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INFORMATION:
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INFORMATION FOR SEQ ID NO: 2: SEQUENCE CHARACTERISTICS:

LENGTH: 126 amino acids

TELEX:

TELEFAX: 201 343-1684

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GENERAL INFORMATION:
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Best Local Similarity 100.0%;
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                                                                  TELEX: 66141 PENNIE (NFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                      ZIP: 10036-2711

COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION:
                                                                                                                                                 ATTORNEY/AGENT INFORMATION:
NAME: LAUTA A. COTUZZÍ
REGISTRATION NUMBER: 30,742
REFERENCE/DOCKET NUMBER: 711
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION DATA:
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                                               SEQUENCE CHARACTERISTICS
                                                                                                                                   TELECOMMUNICATION INFORMATION:
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STATE: New York
                                                                                                                                                                                                                                                                                         APPLICATION NUMBER: FILING DATE:
                                                                                                            TELEPHONE:
                                                                                                                                                                                                                                                                                                                                                                                                                                          COUNTRY:
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TOPOLOGY:
                                                                                                  TELEFAX:
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                               LENGTH:
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5, 6379933
                   amino acid
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                                   126 amino acids
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VENTION: METHOD OF TRANSFERRING AT LEAST TWO
VENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
VENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
VENTION: POLYGLYCOSYLTRANSFERASE
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                                                                                                    : (212) 790-9090
(212) 869-9741/8864
                                                                                                                                                                                                                                                                                                                                                                                                                                              USA
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 linear
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Pred. No. 3.7e-57;
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; MOLECULE TYPE: protein US-09-338-943-2
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Best Local Similarity
Matches 126; Conserv
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Patent No. 5756330
GENERAL INFORMATION:
                                                                  Query Match
Best Local S
                                                         Matches
                                                                                                                                                                                                                                                   ATTORNEY/AGENT INFORMATION:
NAME: Gimmi, Edward R
REGISTRATION NUMBER: 38,891
REFERENCE/DOCKET NUMBER: P314
TELECOMMUNICATION INFORMATION:
TELEPHONE: 610-270-4478
                                                                                                                                                                                                            INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION DATA: APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
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ADDRESSEE: SmithKline Beecham Corporation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE OF INVENTION:
                                                                                                                           MOLECULE TYPE:
                                                                                                                                                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 678 amino acids
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553 VADMLEAASALVEVSKEEDFKPSVESLSRAFNLAEKAE-GVATVDSALFENDQEKALAEA 611
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                                                                                                                                                                                                                                                                                                                                                                                                                                  OPERATING SYSTEM:
SOFTWARE: FastSEQ
                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: 9608 FILING DATE: 18-APR-1996
                                                                                                                                                                                                                                                                                                                                                                            FILING DATE: 1: CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ZIP:
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TOPOLOGY: li
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                                                         Conservative
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for Windows Version
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Pred. No. 3.7e-57;
                                                                      Score 161; DB 1;
Pred. No. 3.5e-09;
                                                         Mismatches
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; ORGANISM: human
US-09-191-647-2
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US-09-191-647-2
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                         SOFTWARE: Pate
SEQ ID NO 2
LENGTH: 1525
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APPLICANT: Goodman, Corey

APPLICANT: Kid, Thomas

APPLICANT: Brose, Katja

APPLICANT: Tessier-Lavigne, Marc

TITLE OF INVENTION: Modulating Robo: Ligand Interactions

FILE REFERENCE: B98-031-3
                                                                                                                                                                                                                                                                                                                     GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                   Sequence 2, Application US/09540245A Patent No. 6270984
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SOFTWARE: PatentIn Ver. 2.0 SEQ ID NO 2
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Best Local Similarity
                                                                                                                                                      CURRENT APPLICATION NUMBER: US/09/540,245A CURRENT FILING DATE: 2000-03-31 PRIOR APPLICATION NUMBER: 60/065,544
                                                                                                                                                                                                              APPLICANT: Brose, Katja
APPLICANT: Tessier-Lavigne, Marc
TITLE OF INVENTION: Modulating Robo: Ligand
FILE REFERENCE: B98-031-3
                                                                                  PRIOR FILING DATE: 1997-11-14
PRIOR APPLICATION NUMBER: 60/
PRIOR FILING DATE: 1998-04-07
PRIOR FILING DATE: 1998-04-07
RUMBER OF SEQ ID NOS: 20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/191,647
CURRENT FILING DATE: 1998-11-13
EARLIER APPLICATION NUMBER: 60/065,544
EARLIER FILING DATE: 1997-11-14
                                                                                                                                                                                                                                                                                  APPLICANT: APPLICANT:
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EARLIER FILING DATE: 1998-04-07
NUMBER OF SEQ ID NOS: 14
                    TYPE: PRT
ORGANISM: human
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                                                                     PatentIn Ver. 2.0
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25.0%;
                                                                                                                       60/081,057
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Pred. No. 0.74;
28; Mismatches
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                                                                                                                                                                                                                                Interactions
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RESULT 12
US-09-103-664A-2
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LENGTH: 1525
TYPE: PRT
ORGANISM: human
               Sequence 2, Application US/09103664A
Patent NO. 6458358
GENERAL INFORMATION:
APPLICANT: University of Kentucky Research Foundation
APPLICANT: Timoney, John
APPLICANT: Artiushin, Sergey
TITLE OF INVENTION: Compounds Encoding the Protective M-Like Protein
TITLE OF INVENTION: and Assays Therefor
FILE REFERENCE: 50229-212
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Best Local Similarity
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CURRENT APPLICATION NUMBER: US/09/540,153
CURRENT FILING DATE: 2000-03-31
PRIOR APPLICATION NUMBER: 09/191,647
PRIOR FILING DATE: 1998-11-13
PRIOR APPLICATION NUMBER: 60/081,057
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APPLICANT: Tessier-Lavigne,
TITLE OF INVENTION: Modulat
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CURRENT APPLICATION NUMBER: US/09/103,664A
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Kid, Thomas
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25.0%; Pred. No. 0.74;
tive 28; Mismatches
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US-08-080-255-7
                                                              US-08-080-255-7
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NUMBER OF SEQ ID NOS: 10
SOFTWARE: PatentIn version 3.0
SEQ ID NO 2
SEQ ID NO 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 7, Application US/08080255 Patent No. 5487970
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Best Local :
Matches
            Query Match
Best Local S
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APPLICANT: Rowley
APPLICANT: Diaz,
                                                                                                                                                          TELEFAX: (512) 474-757
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LENGTH: 534
TYPE: PRT
ORGANISM: Streptococcus equi
                                                                                                                                                                                                                           ATTORNEY/AGENT INFORMATION:
NAME: PATKET, DAVID L.
REGISTRATION UNMBER: 32,165
REFERENCE/DOCKET NUMBER: ARC
TELECOMMUNICATION INFORMATION:
                                                                               TOPOLOGY: 1 MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                  COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOETWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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TITLE OF INVENTION:
TITLE OF INVENTION:
NUMBER OF SEQUENCES:
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FILING DATE: 19930617
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ZIP:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE: Arnold, White & Durkee STREET: P. O. Box 4433
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Match 12.9%; Score 77; DB 4; Length 534
Local Similarity 24.7%; Pred. No. 2.8;
es 37; Conservative 21; Mismatches 40; Indels
                                                                                                             STRANDEDNESS:
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                                                                                                                                                 LENGTH:
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 Conservative
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NO: 7:
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             12.5%; Score 75; DB 32.6%; Pred. No. 17;
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 Mismatches
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                                DB 1;
 25;
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RESULT 15
PCT-US93-05857-7
; Sequence 7, Application PC/TUS9305857
; GENERAL INFORMATION:
; APPLICANT: Board of Regents
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION: 530
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/08/0
FILING DATE: 17 JUNE 1993
ATTORNEY/AGENT INFORMATION:
NAME: Parker, David L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NAME: Parker, David L.
REGISTRATION NUMBER: 32,165
REFERENCE/DOCKET NUMBER: ARI
TELECOMMUNICATION INFORMATION:
TELEPHONE: (512) 320-7200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/465,71:
FILING DATE: 06-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
TITLE OF INVENTION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Rowley, Janet D. APPLICANT: Diaz, Manuel O.
                                                                                                                                                                                                                                                                                                                                                                   MOLECULE TYPE: DNA (genomic)
                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       282 ETSVRGPRIKHVCRRAAVALGRKRAVFPD 310
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                                                                                                                               282 ETSVRGPRIKHVCRRAAVALGRKRAVFPD 310
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STATE: Texas
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                                                                                                                                                                                                                                                                           Local Similarity
nes 29; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                          LENGTH:
                                                                                                                                                                                                                                     5 AVFKQLPEAAALAAANKRVQNLLKKADAALGEV--NESLLQQDEEKALYAAAQGLQ---- 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AVFKQLPEAAALAAANKRVQNLLKKADAALGEV--NESLLQQDEEKALYAAAQGLQ----
                                                                                                                                                                                                    SIGSMLAQADKLPMTDKRVASLLKKAKAQLCKIEKSKSLKQTDQPK----
                                                                                                                                                              -----PKI-----AAAVAEGNFRTALSE 76
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                                                                                                                                                                                                                                                                           12.5%; Score 75; DB 32.6%; Pred. No. 17; tive 13; Mismatches
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                                                                                                                                                                                                                                                                                                                Length 1400;
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                                                                                                                                                                                                      -AQGQESDSS 281
                                                                                                                                                                                                                                                                             22;
                                                                                                                                                                                                                                                                             Gaps
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COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATENTIN Release #1.0, Version #1.25

CURRENT APPLICATION DATA:
APPLICATION NUMBER: PCT/US93/05857

FILING DATE: 1930617

CLASSIFICATION:
PRIOR APPLICATION NUMBER: 07/900,689

FILING DATE: 17/06/92

ATTORNEY/AGENT INFORMATION:
NAME: PATKER: DAVID L.
REGISTRATION NUMBER: 32,165
REFERENCE/DOCKET NUMBER: ARCD:072/PAR
TELEPHONE: (512) 320-7200

TELEPHONE: (512) 474-7577

INFORMATION FOR SEQ ID NO: 7:
SEQUENCE CHARACTERISTICS:
LENGTH: 1400 amino acids
TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
MOLECULE TYPE: DNA (genomic)
PCT-US93-05857-7
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Search completed: December Job time: 6.69005 secs
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TITLE OF INVENTION: COMPOSITIONS AND METHODS FOR DETECTING
TITLE OF INVENTION: GENE REARRANGEMENTS AND TRANSLOCATIONS
NUMBER OF SEQUENCES: 8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STATE: Texas
COUNTRY: USA
ZIP: 77210
                                                                                                                                                   282 ETSVRGPRIKHVCRRAAVALGRKRAVFPD 310
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                                                                                                                                                                                                                                    y Match 12.5%; Score 75; DB 5; Length 1400; Local Similarity 32.6%; Pred. No. 17; hes 29; Conservative 13; Mismatches 25; Indels
                                                                                                                 59 -----PKI-----AAAVAEGNFRTALSE 76
                2, 2002, 12:03:12
                                                                                                                                                                                                                                       25; Indels 22;
                                                                                                                                                                                                                                  Gaps
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4.

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Sequence 4, Appli sequence 15, Appl Sequence 15, Appl Sequence 13113, Appl Sequence 13113, Appl Sequence 13113, Appl Sequence 12389, App Sequence 174, App Sequence 174, App Sequence 274, App Sequence 290, App Sequence 2, Appli Sequence 2, Appli Sequence 11127, App Sequence 11127, Appli Sequence 10147, Appli Sequence 13843, Appli Sequence 13752, Appli Sequence 13752, Appli Sequence 13752, Appli Sequence 178, Appli Sequence 178, Appli Sequence 740, Appli Sequence 740, Appli Sequence 55, Appli Sequence 574, Appli Sequence 740, Appli Sequence 5740, Appli Sequence 5740, Appli Sequence 5740, Appli Sequence 5740, Appli

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Result
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Maximum DB
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Perfect score:
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Maximum Match 100%
Listing first 45 summaries
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Searched:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score
         seg length: 0 seg length: 2000000000
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1: /cgn2_6/ptodata/1/pubpaa/US08_NEW_PUB.pep:*

2: /cgn2_6/ptodata/1/pubpaa/PCT_NEW_PUB.pep:*

3: /cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*

4: /cgn2_6/ptodata/1/pubpaa/US07_PUBCOMB.pep:*

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7: /cgn2_6/ptodata/1/pubpaa/US08_PUBCOMB.pep:*

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11: /cgn2_6/ptodata/1/pubpaa/US09_PUBCOMB.pep:*

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13: /cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*

14: /cgn2_6/ptodata/1/pubpaa/US10_NEW_PUB.pep:*
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Match Length
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       126
989
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         12 US-10-007-267-2
10 US-09-815-242-5143
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10 US-09-815-242-12913
10 US-09-815-242-12913
10 US-09-815-242-12611
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Sequence 2, Appli
Sequence 497, Ap
Sequence 10, Appl
Sequence 25, Appl
Sequence 25, Appl
Sequence 27, Appl
Sequence 27, Appl
Sequence 10499, A
Sequence 1703, Ap
Sequence 1703, Ap
Sequence 1856, A
Sequence 1856, A
Sequence 5834, Ap
Sequence 8, Appli
Sequence 8, Appli
Sequence 5815, Ap
Sequence 1957, A
Sequence 1257, Ap
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US-10-007-267-2
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PATCHI NO. US20020127682A1
GENERAL INFORMATION:
GENERAL INFORMATION:
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INFORMATION FOR SEQ ID NO: 2:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                  ZIP: 07601

ZIP: 07601

COMPUTER READABLE FORM:

MEDIUM TYPE: floppy disk

COMPUTER: IBM PC compatible

OPERATING SYSTEM: PC-DOS/MS-DOS

SOFTWARE: PatentIn Release #1.0, Version #1.25

CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/10/007,267

FILING DATE: 03-Dec-2001

CLASSIFICATION: <Unknown>
                                                                                                                                                                                  PRIOR APPLICATION DATA:

APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNEY/AGENT INFORMATION:

NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
                                                                                                               TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
STREET: 411 Hackensack Avenue
CITY: Hackensack
STATE: New Jersey
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: amino acid
                           LENGTH: 126 amino acids
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US-09-815-242-11209
US-09-756-071B-13
US-09-756-071B-13
US-09-756-071B-13
US-09-815-242-13113
US-09-815-242-5635
US-09-815-242-1389
US-09-811-132-574
US-09-841-132-574
US-09-939-930-517
US-09-939-930-517
US-09-939-930-517
US-10-047-593-4
US-110-047-593-4
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US-09-815-242-10147
US-09-905-983-56
US-09-815-242-13843
US-09-815-242-13752
US-09-841-132-405
US-09-815-242-13752
US-09-815-242-11809
US-09-915-242-11809
US-09-925-297-740
US-09-272-809-5
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; TOPOLOGY: linear; MOLECULE TYPE: protein; SEQUENCE DESCRIPTION: 5 US-10-007-267-2
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                                                                                                                                   ; LOCATION: (1)...(989)
; OTHER INFORMATION: Xaa = Any Amino Acid
US-09-815-242-4897
                                δÃ
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                                                                                                                                                                                                                                                          SEQ ID NO 4897
LENGTH: 989
                                                                                                  Query Match
                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TITLE OF INVENTION: Identification of Essential Genes in TITLE OF INVENTION: Prokaryotes FILE REFERENCE: ELITEA.011A CURRENT APPLICATION NUMBER: US/09/815,242 CURRENT FILING DATE: 2001-03-21 PRIOR APPLICATION NUMBER: 60/191,078 PRIOR FILING DATE: 2000-03-21
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PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR FILING DATE: 2000-10-23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT:
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SOFTWARE: FastSEQ for Windows Version
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                                                                                                                                                                                                                                                                                                                        PRIOR FILING DATE: 2001-02-16
                                                                                                                                                                                                              TYPE: PRT ORGANISM: Enterococcus faecalis
                                                                                                                                                                                                       FEATURE:
                                                                                                                                                                                        NAME/KEY: VARIANT
                                                                                                                                                                                                                                                      ENGTH:
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848 IDAVVSAEQADLSKLFASANILKSRFEDQDFKPSMEALTRVINLAKKGQELLGDTEEGID 907
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                                                                                     Local Similarity
                                1 LQAVAVFKQLPEAAALAAAN------39
                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: 60/257,931 FILING DATE: 2000-12-22
                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: 60/253,625 FILING DATE: 2000-11-27
                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPK
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5. US20020061569A1
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Yamamoto, Robert T.
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                                                                     19; Mismatches
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                                                                     Score 163; DB 10;
Pred. No. 1.1e-08;
9; Mismatches 55;
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Pred. No. 8.2e-54;
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PRIOR APPLICATION NUMBER: 60/191,078
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR PRIOR DATE: 2000-03-21
PRIOR PRILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-26
PRIOR PRILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR PILING DATE: 2000-10-23
PRIOR PILING DATE: 2000-11-23
PRIOR PILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
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US-09-815-242-5143
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                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRIOR FILING DATE: 2001-02-16
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRIOR APPLICATION NUMBER: 60/269,308
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323 ARKOALAOFA -- ANAAAEV 339
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                                                                                                                59 PKIAAAVAEGN-----FRT--ALSELASVKPQVDAFFDGV-MVMAEDAAVKQ 102
                                                                                                                                                                                                                                     Local Similarity
nes 42; Conserv
                                                                                                                                                                                            2 QAVAVFKQLP---EAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQ 58
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                          NRLNLLNRLAEQMNAVADI 121
                                                                                                                                                         INFORMATION:
                                                                             VKTAQAQQQANSQISSSQNLISAAFRNQIALAAQASGEAQVTAFNTQVKQIVNEATAFST
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Xu, H. Howard
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Pred. No. 3.4;
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US-09-847-539A-10

Sequence 10, Application US/09847539A Patent No. US20020061306A1 GENERAL INFORMATION:

APPLICANT: Bjorck,

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; SOFTWARE: PatentIn Ver. 2.1
; SEO ID NO 10
; LENGTH: 271
; TYPE: PRT
; ORGANISM: Streptococcus pyogenes
US-09-847-539A-10
    В
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                                                                                                                                                          ; ORGANISM: Mycobacterium tuberculosis US-09-712-363-259
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                                                                                                                                                                                                                 SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 259
LENGTH: 1289
                                                                                             Query Match
Best Local Similarity
                                                                               Matches
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Best Local Similarity
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TITLE OF INVENTION: STREPTOCOCCAL ALPHA ZM BINDING PROTEIN
FILE REFERENCE: 100084.415US / N.75312B
CURRENT APPLICATION NUMBER: US/09/847,539A
CURRENT FILING DATE: 2001-05-01
NUMBER OF SEQ ID NOS: 30
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APPLICANT: Marcotte, Edward M.
TITLE OF INVENTION: DETERMINING THE FUNCTIONS
TITLE OF INVENTION: INVERACTIONS OF PROTEINS
FILE REFERENCE: 07419-032001
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PRIOR
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CURRENT FILING DATE: 2000-11-13
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245 IEEAAGVLKHRKRKEKALRKLDTMAANLARLTDLTTELRRQLKPLGRQAEAAQRAAAIQA 30.
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                                    10 LPEAAALAAANKRVQNLLKKAD-----AALGEVNESLLQQDEEKALYAAAQGLQPKIAA 63
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                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: 1999-05-14
APPLICATION NUMBER: 60/134,092
FILING DATE: 1999-05-14
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                                                                           12.6%; Score 75.5; 1
25.0%; Pred. No. 11;
tive 21; Mismatches
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27.5%; Pred. No. 1.
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CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-10-23
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SEQ ID NO 58
LENGTH: 905
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Best Local Similarity
Matches 30; Conserv
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APPLICANT:
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APPLICANT: Ben-Ze'ev, Avri
APPLICANT: Sadot, Einat
TITLE OF INVENTION: METHODS AND THERAPEUTIC COMPOSITIONS FOR TREATING CANCER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILE REFERENCE: 01/22326
CURRENT APPLICATION NUMBER: US/09/905,983
CURRENT FILING DATE: 2001-09-28
                                                                                                                                                                                                           TITLE OF INVENTION: Identification of Essential Genes
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
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Zyskind, Judith W.
Wall, Daniel
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Yamamoto, Robert T
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Pred. No.
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7.7;
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PRIOR APPLICATION NUMBER: US 08/833,457
PRIOR FILING DATE: 1997-04-01
NUMBER OF SEQ ID NOS: 370
SECTIANE: FASTSEQ for Windows Version 4.0
SEQ ID NO 206
LENGTH: 400
TYPE: PRT
ORGANISM: Helicobacter pylori
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US-09-881-752A-206
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PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FastSEQ for Windows Version
SEQ ID NO 12913
LENGTH: 2186
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Sequence 10499, Application US/09815242
Patent No. US20020061569A1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TITLE OF INVENTION: Identification of Polynucleotides
TITLE OF INVENTION: Encoding No. US20020115078Ale1 Helicobacter Polypeptides in the
TITLE OF INVENTION: Genome
FILE REFERENCE: 06132/041002
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CURRENT FILING DATE: 2001-06-15
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                                                                                                                                            72 TALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAV 118
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                                                                                                          EV--TLKSLKTEODKL---ILSMOKDYAIYNORLTLLEKERONLNAL 229
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Tomb, Jean-Francois
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28.0%; Pred. No. 3.7;
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CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR ETILING DATE: 2000-05-23
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR TILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR FILLING DATE: 2000-12-22
PRIOR FILLING DATE: 2000-12-22
PRIOR FILLING DATE: 2000-12-22
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NUMBER OF SEQ ID NOS: 14110
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 10499
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APPLICANT: Haselbeck, Robert
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APPLICANT:
APPLICANT:
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APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
TITLE OF INVENTION: Identification of ESSITITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
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TYPE: PRT
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27 KRDEKATEKTSVSKKVLNLMENSEIGSMDSIFTQDEASINAQSNVFEGLYQLDEKDQLIP 86
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les 31; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --DGVMVMAEDAAVKQ 102
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Zyskind, Judith W.
Wall, Daniel
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Yamamoto, Robert T.
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22.8%; Pred. No. 5.6;
vative 21; Mismatches
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                                                                                                                                            Essential Genes
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APPLICATION NUMBER: 60/ FILING DATE: 2000-05-23

60/206,848

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; LOCATION: (1)...(2025)
; OTHER INFORMATION: Xaa = Any Amino Acid
US-09-815-242-5703
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SOFTWARE: FastSEQ for Windows Version
SEQ ID NO 5703
SOFTWARE: FastSEQ
SEQ ID NO 12611
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Best Local Similarity
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Patent No. US20020061569A1
                                                                                                                                                                                                                                                                                                            FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
                                                                                                                                                                                                                                                                                                                                                                                                               TITLE OF INVENTION: Identification of Essential Genes
                                       NUMBER OF SEQ ID NOS:
                                                      PRIOR FILING DATE: 2001-02-16
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                                                                                                                                                                                                                                                                         PRIOR FILING DATE: 2000-05-23
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OR FILING DATE: 2000-10-23
OR APPLICATION NUMBER: 60/253,625
OR FILING DATE: 2000-11-27
IOR APPLICATION NUMBER: 60/257,931
FOR APPLICATION NUMBER: 60/257,931
FOR APPLICATION NUMBER: 60/257,931
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                                                                                                     APPLICATION NUMBER: 60/257,931 FILING DATE: 2000-12-22
                                                                                                                                        FILING DATE: 2000-10-23
APPLICATION NUMBER: 60/253,625
FILING DATE: 2000-11-27
                                                                                                                                                                                                   APPLICATION NUMBER: 60/207,727
FILING DATE: 2000-05-26
APPLICATION NUMBER: 60/242,578
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APPLICATION NUMBER: 60/269,308
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Zyskind, Judith W.
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               for Windows Version 4.0
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US-09-815-242-11856
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Best Local Similarity
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CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes
TITLE OF INVENTION: Prokaryotes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR FILING DATE: 2000-1; PRIOR APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/242,578
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                                                                                                                                                                                                                                                                                                                                                LENGTH: 393
TYPE: PRT
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                                  108 -LNRLAEQMNAVADIALLG 125
                                                                                                                                                  154 DYHMGITAENLAEKYGLTREEQDAFAAAS--QQKAIAAIEGGRFRDEITPIQVPQRKGEP 211
                                                                                                                72
                                                                                                                                                                                     31 DAALGEVNESLLQQ-----DEEKALYAAAQGLQPKIAAAVAEGNFR------
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VLARIASYASAGVDPAIMG 290
                                                                          LGFDTDEQPRAGTTVEALAKLKPAFRKDGSVTAGNASSLNDGAAAVLLMSAAKAKALGLP
                                                                                                            ------TALSELASVKP------QVDAFFDGVMVMAEDAAVKQNRLNL- 107
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                                                                                                                                                                                                                               Conservative
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Pred. No. 5.
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Pred. No.
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US-09-815-242-5834

Sequence 5834, Application US/09815242 Patent No. US20020061569A1

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PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-12-22
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APPLICANT:
APPLICANT:
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CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
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SOFTWARE: FastSEQ for Windows Version
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                       APPLICANT: Xu, H. H
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TITLE OF INVENTION:
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Trawick, John D.
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Zyskind, Judith W.
Wall, Daniel
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                                                                                 Carr, Grant J.
                                                                                                      Trawick, John D.
                                                              Yamamoto, Robert T
                                          H. Howard
                       Identification of Essential Genes
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26.0%; Pred. No. 64;
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QΥ
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PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
                                                                                                                                                                                                       US-09-847-539A-8
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SOFTWARE: FastSEQ for
SEQ ID NO 12996
                                                                                                                                                                                                                                                             APPLICANT: Rassmussen, Magnus
TITLE OF INVENTION: STREPTOCOCCAL ALPHA ZM BINDING
FILE REFERENCE: 100084.415US / N.75312B
CURRENT APPLICATION NUMBER: US/09/847,539A
CURRENT FILING DATE: 2001-05-01
NUMBER OF SEQ ID NOS: 30
SOFTWARE: Patentin Ver. 2.1
SEQ ID NO 8
LENGTH: 259
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INFORMATION:
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                                                                                                                                                             Query Match
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CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191/078
PRIOR FILING DATE: 2000-03-21
                                                                                                                          Matches
                                                                                                                                             Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Bjorck, Lars H
APPLICANT: Rassmussen, M
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PRIOR FILING DATE: 2000-12-22
PRIOR APPLICATION NUMBER: 60/269,308
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                                                                                                                                                                                                                                          LENGTH: 25
TYPE: PRT
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61 IAAAVAEGNFRTALSELASVKPQVDAF--FDGVMVMAEDAAVKQNRLNLLNRLAEQMNAV 118
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                                           PEKLALRNEERAIDELKKQAIEDKEATTAIEAASSDALEALADQ------ADALQSE 95
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Search completed: December 2, 2002, 12:15:58 Job time : $5.52541 \ \text{secs}$

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Result
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            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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glycine :: Neiss :5-May-2 :0n: G81 :1, J.; :1, S.; :1,	IALLGE IIIII			Match Local Simi les 121;	30 121 20.2 31 119 19.9 32 103.5 17.3 33 92.5 15.5 34 91 15.2 35 86.5 14.5 36 86.5 14.1 39 84.5 14.1 40 84 14.0 42 83 13.9 43 82.5 13.8 45 82.5 13.8 45 82.5 13.8 45 82.5 13.8 46 82.5 13.8 47 83.5 13.8 48 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 49 82.5 13.8 40 82.5 13.8 41 92 92 92 92 92 92 92 92 92 92 92 92 92	
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gase ingit uence M.; E		SELAS	VALAAA VALAAA	96.2% 96.0% 7ative	1664 2 1667 2 688 2 688 2 688 2 1010 2 11025 2 11025 2 11025 2 1025 2 804 2 80	
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6.1.1.14) beta chain NMA ision 05-May-2000 #text_s, K.D.; Bentley, S.D.; r, S.; Moule, S.; Mungal		TAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVAD 	LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPK 	Score 575; DB 2; Lengt Pred. No. 4.1e-40; 2; Mismatches 3; Ind	1330 1257 1617 1619 1619 1619 1610	
A0523 [imported] - Neisseria _change 03-Jun-2002 Churcher, C.; Klee, S.R.; Mo Ll, K.; Quail, M.A.; Rajandre		LNRLAEQMNAVAD 120 LNRLAEQMNAVAD 681	KALYAAAQGLQPK 60 : KALFAAAQGLQPK 621	th 687; dels 0; Gaps 0;	glycine-tRNA ligas probable aminoacyl glycyl-tRNA synthe hypothetical prote secreted leucine-r probable decarboxy Httl3 transducer [i transducer protein Htf5 transducer [i arginyl-tRNA synth hypothetical prote 1600 golqi antigen paramyosin - nemat leisseria meningitidis (strai change 19-Jan-2001 A.C.; Nelson, K.E.; Eisen, schmann, R.D.; Dougherty, B. Masignani, V.; Pizza, M. Masignani, V.; Pizza, M. Masignani, V.; Pizza, M. Masignani, C.R.; Rappuoli, R.; lis serogroup B strain MC58.	

A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z2491 A;Reference number: A81775; MUID:20222556; PMID:10761919 A;Accession: G81970

Q

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RESULT 3
$770812

Qlycine-tRNA ligase (EC 6.1.1.14) - Neisseria meningitidis (fragment)

Qlycine-tRNA ligase (EC 6.1.1.14) - Neisseria meningitidis (fragment)

NiAlternate names: glycyl tRNA synthetase

C; Species: Neisseria meningitidis

C; Species: Neisseria meningitidis

C; Species: Neisseria meningitidis

C; Accession: S70812

R; Cennings, M.P.; Hood, D.W.; Peak, I.R.A.; Virji, M.; Moxon, E.R.

Rol. Microbiol. 18, 729-740, 1995

A; Title: Molecular analysis of a locus for the biosynthesis and phase-variat

A; Reference number: S70812

A; Accession: S70812

A; Accession: S70812

A; Status: preliminary; nucleic acid sequence not shown; translation not show

A, Status: preliminary; nucleic acid sequence not shown; translation not show
            A;Cross-references: EMBL:U25839; NID:g973183; A;Note: the nucleotide sequence was submitted C;Genetics:
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C;Superfamily: glycine-tRNA ligase
C;Keywords: ligase
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C;Superfamily: glycine-tRNA ligase
C;Keywords: ligase
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A;Molecule type: DNA
A;Residues: 1-687 <PAR>
A;Cross-references: GB:
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A; Residues: 1-87 < JEN>
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 A; Title:
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DNA Sequence of both
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ce: serogroup A, strain Z2491
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96.0%;
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97.7%;
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Pred. No. 2.8e-27;
Prematches 0;
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Pred. No. 7.3e-40;
2; Mismatches
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Library, April 1995
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N;Alternate names: glycyl-tRNA synthetase beta chain
C;Species: Haemophilus influenzae
C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 03-Jun-2002
C;Accession: B64103
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A;Molecule type: DNA
A;Residues: 1-688 <HEI>
A;Cross-references: GB:AE004094; GB:AE003852; NID:g9654407; PIDN:AAF93198.1;
A;Experimental source: serogroup O1; strain N16961; biotype El Tor
C;Genetics:
                                                                                                                                                                                                                                                                                                                               A;Cross-references: GB:U32774; GB:L42023; NID:g1573942; PIDN:AAC22584.1; C;Superfamily: glycine-tRNA ligase beta chain C;Keywords: aminoacyl-tRNA synthetase; ligase; protein biosynthesis
                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; A;Title: Whole-genome random sequencing and assembly of Haemophilus A;Reference number: A64000; MUID:95350630; PMID:7542800 A;Accession: B64103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M. Science 269, 496-512, 1995
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A;Accession: F82373
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A; Residues: 1-688 <TIGR>
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C; Superfamily: glycine-tRNA ligase beta
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  ISVL
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52.8%; Pred. No. 7.4e-17;
Live 23; Mismatches 35
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Pred. No. 4.5e-15;
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RESULT 6
B33645
glycyl-trna synthetase beta chain PA0008 [imported] glycyl-trna synthetase beta chain PA0008 [imported] C;Species: Pseudomonas aeruginosa
C;Date: 15-Sep-2000 #sequence_revision 15-Sep-2000 #te

#text_change

31-Dec-2000

Pseudomonas

aeruginosa

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glycine tRNA synthetase beta subunit [imported] - C;Species: Escherichia coli C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 C;Accession: B91184
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R; Stover, C.K.; Pham, X.Q.; Erwin,
adman, S.; Yuan, Y.; Brody, L.L.; (
.; Lory, S.; Olson, M.V.
Nature 406, 959-964, 2000
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C;Superfamily:
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A; Residues: 1-689 <HAY>
A; Cross-references: GB:BA000007; PIDN:BAB37865.1; PID:913363916; GSPDB:GN00154
A:Experimental source: strain O157:H7, substrain RIMD 0509952
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                                                                                                                               В
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                                                                                                                                                                                                                                                                                                                                                                                                                                               gasawara, N.; Yasunaga,
DNA Res. 8, 11-22, 2001
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A;Molecule type: DNA
A;Residues: 1-684 <STO>
 В
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  B91184
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A; Gene: glyS; PA0008
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Cross-references: GB: AE004440;
                                                                                                                                                                                                Best Loc
Matches
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                                                                                                                                              1 LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGE-VNESLLQQDEEKALYAAAQGLQP 59 ::||: |: | | | | |: || |: || |:
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DISLL
                                DIALL 124
                                                                              KIAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVA 119
                                                                                                                             MKAVSHFRTLEAAAALAAANKRVSNILAKSDEVLSDRVNASTLKEPEEIKLAMQYYYVLRD 623
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                                                             KLEPYFAEGRYODALVELAELREPVDAFFDKVMVMVDDKELRINRLTMLEKLRELFLRVA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61;
                                                                                                                                                                                                                                                              glycine-tRNA ligase beta chain
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Makino, K.; Ohnishi, M.;
Kasunaga, T.; Kuhara, S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               glycine-tRNA ligase beta chain
 889
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   684
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                                                                                                                                                                                                Conservative
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                                                                                                                                                                                                            42.2%; Score 252.5;
48.0%; Pred. No. 2.3
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Pred. No. le
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                                                                                                                                                                                              Mismatches
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Shiba, T.; Hattori, M.; Shinagawa,
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A.; Larbig,
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K.; Lim,
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RESULT

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A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1,'Q',3-90,'P',92-153,'AAA',157-210,'DG',213-341,'D',343-360,'V',362-689
A;Residues: 1,'Q',3-90,'P',92-153,'AAA',157-210,'DG',213-341,'D',343-360,'V',362-689
A;Ross references: GB.J01622; NID:9146221; PIDN:AAA23915.1; PID:9146223
A;Note: the authors translated the codons GAC and GTC for residues 342 and 361 as Leu
R;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; Riley, M.;
Rose, D.J.; Mau, B.;Shao, Y.
Science 277, 1453-1462, 1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          glycine-tRNA ligase (EC 6.1.1.14) beta chain - Esch N;Alternate names: glycyl-tRNA synthetase beta chai C;Species: Escherichia coli C;Date: 28-Aug-1985 #sequence_revision 17-May-1996 C;Accession: $47780; I41242; A01189; A65155 R;Plunkett, G.
                                                                                                                                                                                                               A;Cross-references: GB:J01623; NID:g146224; PIDN:AAA23917.1; PID:g146226 R;Webster, T.A.; Gibson, B.W.; Keng, T.; Biemann, K.; Schimmel, P. J. Biol. Chem. 258, 10637-10641, 198
A;Title: Primary structures of both subunits of Escherichia coli glycyl-trNa A;Reference number: A92392; MUID:83290996; PMID:6309809
A;Accession: A01189
                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-20 < RES>
                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Cross references: EMBL:U00039; NID:g466582; PIDN:AAB18536.1; R;Keng, T.; Webster, T.A.; Sauer, R.T.; Schimmel, P.R. J. Biol. Chem. 257, 12503-12508, 1982
A;Title: Gene for Escherichia coli glycyl-tRNA synthetase has takeference number: I41241; MUID:83030764; PMID:6290471
A;Accession: I41242
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A; Residues: 1-689 < PLU>
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C;Superfamily: glycine-tRNA ligase beta chain
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A;Molecule type: DNA
A;Residues: 1-689 <STO>
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                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Status: preliminary
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complete genome
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Pred. No. 2.3
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  Escherichia coli K-12
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Riley, M.;
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C;Accession: AH0494
R;Parkhill, J; Wren, B.W.; Thomson, N.R.; Titball, R.W.; Holden, M.T.G.; Prentice, M.B. deno-Tarraga, A.M.; Chillingworth, T.; Cronin, A.; Davies, R.M.; Davis, P.; Dougan, G.; il, M.; Rutherford, K.; Simmonds, M.; Skelton, J.; Stevens, K.; Whitehead, S.; Barrell, Nature 413, 523-527, 2001
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                      RESULT
AI0980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A;Title: Genome sequence of Yersinia pestis, the causative agent of plague. A;Reference number: ABO001; MUID:21470413; PMID:11586360 A;Accession: AH0494
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  glycine-trNA ligase (EC 6.1.1.14) [imported] - Yersinia pestis (strain CO92)
C;Species: Yersinia pestis
C;Date: 02-Nov-2001 #sequence_revision 02-Nov-2001 #text_change 03-Jun-2002
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glycine-tRNA ligase (EC 6.1.1.14)
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Matches
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47.2%; Pred. No. 4.9e-13;
tive 21; Mismatches 44
                                                                                                                                                                                                                                                                                                                                                                     40.4%; Score 241.5; DB 2
46.4%; Pred. No. 1.8e-12;
Live 23; Mismatches 43
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      Salmonella
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      enterica
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, S.; Moule, S.; O'Gaora, P.
Nature 413, 848-852, 2001
A;Authors: Parry, C.; Quail, M.; Rutherford, K.; Simmonds, M.; Skelton, J.;
A;Title: Complete genome sequence of a multiple drug resistant Salmonella en
A;Reference number: AB0502; PMID:11677608
A;Accession: AI0980
A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi C;Date: 09-Nov-2001 *sequence_revision 09-Nov-2001 *text_change C;Accession: AI0980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R;Parkhill, J.; Dougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, Jth, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White,
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C;Keywords: ligase
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A; Residues: 1-689 <PAR>
A; Cross-references: GB:
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S.; O'Gaora, P.
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DISLL
                                                                                                              KIAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVA 119
                                                                                                                                                                                                                                                                      1 Similarity
56; Conser
                                                                                                                                                                                                                                                                        Conservative
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                                                                                                                                                                                                                                                                                         38.4%;
                                                                                                                                                                                                                                                                        26;
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Pred. No. 1.8e-11;
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C;Species: Xylella fastidiosa C;Date: 18-Aug-2000 #sequence_revision C;Accession: A82617 glycyl·tRNA synthetase beta chain XF1959 [imported] · Xylella fastidiosa (strain C;Species: Xylella fastidiosa 20-Aug-2000 #text_change 02-Sep-2000

R;anonymous, The Xylella fastidiosa Consortium of the Organization for Nucleotide Nature 406, 151-157, 2000

A;Title: The genome sequence of the plant pathogen Xylella fastidiosa.

A;Reference number: A82515; MUID:20365717; PMID:10910347

A;Note: for a complete list of authors see reference number A59328 below

A; Accession: A82617

A; Status: preliminary

A; Molecule type: DNA A; Residues: 1-722 <SIM>

A;Cross-references: GB:AE004015; GB:AE003849; NID:g9107057; PIDN:AAF84761.1; GSPDB:GN

A, Experimental Source: Strain 9aSc
A, Experimental Source: Strain 9aSc
R, Simpson, A.J.G., Reinach, F.C., Arruda, P.; Abreu, F.A.; Acencio, M.; Alvarenga, R. R; Simpson, A.J.G., Reinach, F.C., Arruda, P.; Camargo, L.E.A.; Carraro, D.M.; Carrer as Neto, E.; Dueno, M.R.P.; Camargo, A.A.; Camargo, L.E.A.; Carraro, D.M.; Carrer as Neto, E.; Docena, C.; El-Dorry, H.; Facincani, A.P.; Ferreira, A.J.S.
submitted to Genbank, June 2000
A; Authors: Ferreira, V.C.A.; Ferro, J.A.; Fraga, J.S.; Franca, S.C.; Franco, M.C.; Fr J.D.; Junqueira, M.L.; Kemper, E.L.; Kitajima, J.P.; Krieger, J.E.; Kuramae, E.E.; La chado, M.A.; Madeira, M.M.B. M.; Marino, C.L.; Marques, M.V.; Martins A; Authors: Martins, E.M.F.; Matsukuma, A.Y.; Menck, C.F.M.; Miracca, E.C.; Miraki, C., F.G.; Nunes, L.R.; Oliveira, M.A.; de Oliveira, M.C.; de Oliveira, R.C.; Palmieri, Rodrigues, V.; Rosa, A.J. de M.; de Rosa Jr., V.E.; de Sa, R.G.; Santelli, R.V.; Sawa A; Authors: da Silva, A.C.R.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, F.R.; da Silva, A.M.; Silva Jr., W.A.; da Silva, R.G.; Palmieri, A.; Reference number: A59328 A; Contents: annotation C; Genetics:

A; Gene: XF1959 C; Superfamily: glycine-tRNA ligase beta chain

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glycyl-tRNA synthetase, beta chain nmb1930 [imported] - Agrobacterium tumefaciens (strai c; Species: Agrobacterium tumefaciens C; Species: Agrobacterium tumefaciens C; Date: 30-Sep-2001 #sequence_revision 30-Sep-2001 #text_change 11-Jan-2002 C; Accession: B97437 R; Goodner, B.; Hinkle, G.; Gattung, S.; Miller, N.; Blanchard, M.; Qurollo, B.; Goldman, A.; Liu, F.; Wollam, C.; Allinger, M.; Doughty, D.; Scott, C.; Lappas, C.; Markelz, B.; Science 294, 2323-2328, 2001 A; Title: Genome Sequence of the Plant Pathogen and Biotechnology Agent Agrobacterium tum A; Reference number: A97359; PMID:11743194
                                                          ster, E.W.
A;Title: The Genome of the
A;Reference number: AB2577;
A;Accession: AF2655
A;Status: preliminary
                                                                                                                                                                                         C;Accession: AF2655
R;Wood, D.W; Setubal, J.C.; Kaul, R.; Monks, D.; Chen, L.; Wood, G.E.; Chen, Y.; erage, G.; Gillet, W.; Grant, C.; Guenthner, D.; Kutyavin, T.; Levy, R.; Li, M.; M.; Karp, P.; Romero, P.; Zhang, S. Science 294, 2317-2323, 2001
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B97437
A; Molecule type: DNA
A; Residues: 1-717 <KUR>
A; Cross-references: GB:
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A; Molecule type: DNA
A; Residues: 1-717 <KUR>
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A;Map position: ci
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GB:AE008688; PIDN:AAL41660.1; PID:g17739002; GSPDB:GN00186
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                                                                                                                                                                  Y.; Biddle, P.; Jung, M.; Krespan, W.; Perry, M.; Gordon-Kamm,
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41.0%; Pred. No. 7.2e-10;
                                                                                                          Natural Genetic Engineer Agrobacterium tumefaciens C58; PMID:11743193
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glycine-tRNA ligase (EC 6.1.1.14) [imported] - Brucella melitensis (strain 16M) C.Species: Brucella melitensis
C;Date: 01-Feb-2002 #sequence_revision 01-Feb-2002 #text_change 03-Jun-2002
C;Accession: AC3443
C;DelVecchio, V.G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanov.; Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Let Proc. Natl. Acad. Sci. U.S.A. 99, 443-448, 2002
A;Title: The genome sequence of the facultative intracellular pathogen Brucella melit A;Reference number: AD3252; PMID:11756688
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C;Superfamily: glycine-tRNA ligase
C;Keywords: ligase
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A;Residues: 1-780 <KUR>
A;Cross-references: GB:AE008917; PIDN:AAL52710.1; PID:g17983538; GSPDB:GN00190
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T 280		IN=F62; INB=95053752; PubMed=796449 chlich E.C.; etic locus for the biosynth seria gonorrhoeae lipooligo xp. Med. 180:2181-2190(1994 CATALYTIC ACTIVITY: ATP + 91cyy1-tRNA(Gly). SUBUNIT: TETRAMER OF TWO AL (BY SIMILARITY) BELONGS TO CLAS SUBCELLULAR LOCATION: Cytop SIMILARITY: BELONGS TO CLAS	(Glyks) (Fragment). noorhoeae. roteobacteria; beta 85;	TANDARD; . 36, Cr . 36, La . 40, La	513 701 572 1115 2477 701 1205 1963 953 1325 1426
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16-OCT-2001 (Rel. 40, I
Glycyl-tRNA synthetase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Heidelberg J.F., Eisen J.A., Nelson W.C., Clayton R.A., Gwinn M.L., Dodson R.J., Haft D.H., Hickey E.K., Peterson J.D., Umayam L.A., Gill S.R., Nelson K.E., Read T.D., Tettelin H., Richardson D., Ermolaeva M.D., Vamathevan J., Bass S., Qin H., Dragoi I., Sellers P. McDonald L., Utterback T., Fleischmann R.D., Nierman W.C., White O., Salzberg S.L., Smith H.O., Colwell R.R., Mekalanos J.J., Venter J.C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Q9KVW8;
16-OCT-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
STRAIN-E1 TOT N16961 / Serotype 01;
MEDLINE-20406833; PubMed-10952301;
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Bacteria; Proteobacteria;
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                                                                                                                                                                                                                                                          Complete proteome
                                                                                                                                                                                                                                                                                          TIGRFAMS; TIGR00211; glyS; 1.
PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB;
                                                                                                                                                                                                                                                                                                                       InterPro; IPR002311; tRNA_synt_2f.
Pfam; PF02092; tRNA_synt_2f; 1.
PRINTS; PR01045; TRNASYNTHGB.
                                                                                                                                                                                                                                                                                                                                                                   EMBL; AE004094; AAF93198.1; TIGR; VC0020; -.
                                                                                                                                                                                                                                                                                                                                                                                                                  or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nature 406:477-483(2000).
-I- CATALYTIC ACTIVITY: AIP + glycine + trna(Gly) = AM:
- + 91ycyl-trna(Gly).
-I- SUBUNIT: TETRAMER OF TWO ALPHA AND TWO BETA CHAINS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               "DNA sequence of both chromosomes of the cholera pathogen Vibrio cholerae.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Fraser C.M.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=666;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           beta chain)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SYGB_VIBCH
                                                                                                                                                                                                                                                                            Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase; ATP-binding;
 682
                            120
                                                            622
                                                                                                                       562
                                                                                         60
                                                                                                                                      SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SUBCELLULAR LOCATION: Cytoplasmic.
               DIALL 124
                                                                            KIAAAVAEGNERTALSELASVKPQVDAFEDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVA 119
DISLL 686
                                                           ALEPAFATGNYQEALSKLAGLRAPVDAFFDNYMYMADDEALKKNRLTLLNKLRNLFLQIA
                                                                                                                       VKAVSHFRALEEAEALAAANKRVGNILAKYDGELGEEIDLALLQEDAEKALAEAVEIMAE 621
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(Rel. 40,
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                                                                                                                                                                                                                                               75924 MW;
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Last annotation update)
e beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
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                                                                                                                                                                                    23;
                                                                                                                                                                                                  Score 294.5;
Pred. No. 2.0
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                                                                                                                                                                                    Mismatches
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5:
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                                                                                                                                                                                    1;
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                                                               681
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RESULT 3
SYGB_HAEAE
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                                                                                                                                                     RESULT 4
SYGB_HAEIN
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Best Local :
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15-JUL-1998
16-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                        EMBL; AF018635; AAB70306.1; -...
InterPro; IPR002311; tRNA_synt_2f.
Pfam; PF02092; tRNA_synt_2f; 1.
PROSITE; PS50861; AA_TRNA_LIGASE, II_GLYAB; 1.
Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase;
NON_TER 1 1
                                                                     p43822;
01-NOV-1995 (Rel. 32, Created)
01-NOV-1995 (Rel. 32, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation updat
Glycyl-tRNA synthetase beta chain (EC 6.1.1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       030836;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Entropean Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content
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                                                 beta chain) (G1
GLYS OR HI0924
                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -1- SUBCELLULAR LOCATION: Cytoplasmic.
-1- SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      + glycyl-trna(Gly).
-i- SUBUNIT: TETRAMER OF TWO ALPHA AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STRAIN-F3031;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bacteria;
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                      Haemophilus influenzae.
Bacteria; Proteobacteria;
                                                                                                                                          SYGB_HAEIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=725;
             Haemophilus
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                                                                                                                                                                                                                                                                                  61
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                                                                                                                                                                                                                                                       VQPLIEQGDYTTVLDKLANLRAPVDSFFDNVMVNAEDPALRQNRLAILNTLQGLFLQVAD
                                                                                                                                                                                                                                                                       TAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVAD 120
                                                                                                                                                                                                                                                                                                          VRAVSHFRTLDSAEALAAANKRVSNILAKADAAIGEINLTVCVEQAEKALAEAVLALRTE 220
                                                                                                                                                                                                                                                                                                                                                             l Similarity
59; Conser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Proteobacteria;
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98 (Rel. 36, Last sequence upd
11 (Rel. 40, Last annotation u
4A synthetase beta chain (EC 6
1) (GlyRS) (Fragment).
                                                                                                                                                                                                          284
                                                                                                                                                                                                                                  124
                                                                                                                                                                                                                                                                                                                                                                                                                285 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 aegyptius.
                                                              (GlyRS).
                                                                                                                                                                                                                                                                                                                                                            Conservative
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                                                                                                                                           STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                30957 MW;
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                         gamma
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                                                                                                                                                                                                                                                                                                                                                             27;
                                                                                                                                                                                                                                                                                                                                                            Score 278; DB 1;
Pred. No. 2.5e-16;
7; Mismatches 38
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                           subdivision;
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5 6.1.1.14)
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6.1.1.14) (Glycine--tRNA ligase
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                           Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                                                       Length 285;
                                                                             (Glycine--tRNA ligase
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RESULT 5
SYGB_ECOLI
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Best Local S
Matches 59
                                           SYGB_ECOLI STANDARD; PRT; 688 AA.

1 P00961;
21-UUL-1986 (Rel. 01, Created)
1 1-FEB-1995 (Rel. 31, Last sequence update)
1 16-CCT-2001 (Rel. 40, Last annotation update)
2 Glycyl-tRNA synthetase beta chain (EC 6.1.1.1)
2 beta chain) (GlyRS).
3 GLYS OR GLYS (B) OR B3559.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Fleischmann R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F., Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M., McKenney K., Sutton G., Fitzhugh W., Fleids C.A., Gocayne J.D., Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M., Weidman J.F., Phillips C.A., Spriggs T., Hedblom E., Cotton M.D., Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C., Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M., Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TIGRFAMS; TIGRO0211; glyS; 1.
PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.
Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; U32774; AAC22584.1; -.
TIGR; H10924; -.
InterPro; IPR002311; tRNA_synt_2f.
Pfam; PF02092; tRNA_synt_2f; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STRAIN=Rd / KW20 / ATCC 51301, MEDLINE=95350630; PubMed=7542800;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       [1]
SEQUENCE FROM
              Escherichia
                       Bacteria; Proteobacteria;
                                          Escherichia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Science 269:496-512(1995)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Venter J
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Whole-genome random sequencing and assembly of Haemophilus influenzae
                                                                                                                                                                                                                                        684
                                                                                                                                                                                                                                                                                                624
                                                                                                                                                                                                                                                                                                                                                        121
                                                                                                                                                                                                                                                                                                                               61
                                                                                                                                                                                                                                                                                                                                                                      SUBCELLULAR LOCATION: Cytoplasmic.
SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             + glycyl-tRNA(Gly).
SUBUNIT: TETRAMER OF TWO ALPHA AND
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KW20 / ATCC 51907;
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                          gamma
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                                                                                                                                                                                                                                                                                                                                                                                                                                 Score 273; DB 1;
Pred. No. 1.7e-15;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                67F9ACEF00A94184
                          subdivision; Enterobacteriaceae;
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                                                                                update)
6.1.1.14)
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                                                                                (Glycine--tRNA ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 688;
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Matches
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MEDLINE-83030764; PubMed=6290471;

Keng T., Webster T.A., Sauer R.T., Schimmel P.;

"Gene for Escherichia coli glycyl-tRNA synthetase has tandem subunit coding regions in the same reading frame.";

J. Biol. Chem. 257:12503-12508(1982).
                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a between the Swiss Institute of Bioinformatics and the EMBI the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and f
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Comparing the predicted and observed properties of in the genome of Escherichia coli K-12."; Electrophoresis 18:1259-1313(1997).
-!- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) =
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN-K12 / MG1655;
MEDLINE-94316500; Pubmed-8041620;
Sofia H.J., Burland V., Daniels D.L., Plunkett G. III, Blattner F.R.;
Sofia H.J., Burland V., Daniels D.L., Plunkett G. III, Blattner F.R.;
"Analysis of the Escherichia coli genome. V. DNA sequence of the
region from 76.0 to 81.5 minutes.";
Nucleic Acids Res. 22:2576-2586(1994).
                                                                                                                                                               PRINTS; FRULTY, 11GRO0211; glyS; 1.
TIGREAMS; TIGRO0211; glyS; 1.
PROSITE; PS50861; AA TRNA LIGASE_II_GLYAB; 1.
PROSITE; PS50861; AA TRNA LIGASE_II_GLYAB; 1.
                                                                                                                                                                                                                                              ECOJUMANJ, J. 1919S.
ECOGENE; EG10410; glyS.
InterPro; IPR002311; tRNA_synt_2f.
InterPro; PRNA_synt_2f; 1.
                                                                                                                                                                                                                                                                                                                       EMBL; J01622; AAA23915.1; -. EMBL; U00039; AAB18536.1; -. EMBL; AE000433; AAC76583.1; -. EMBL; J01623; AAA23917.1; -.
                                                                                                                                                                                                                                                                                                                                                                                             entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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J. Biol. Ch
                                                         SEQUENCE
                                                                                                                                                                                                                                                                                           PIR; A01189; SYECGB.
ECO2DBASE; E077.5; 6TH EDITION
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=K12 / EMG2;
MEDLINE=97443975; PubMed=9298646;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE OF 1-12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Webster T.A., Gibson B.W., Keng T., Biemann K., Schimmel P. "Primary structures of both subunits of Escherichia coli gl
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=83290996; PubMed=6309809;
Webster T.A., Gibson B.W., Keng T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       [1]
SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Link A.J., Robison K.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SUBUNIT: TETRAMER OF TWO ALPHA AND TWO BETA CHAINS.
SUBCELLULAR LOCATION: Cytoplasmic.
SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          glycyl-tRNA(Gly).
                                                                                                                                                                                                                                     PR01045; TRNASYNTHGB.
                Similarity
                                                        0
1
90
153
210
341
360
688 AA;
 Conservative
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                                                                       90
155
211
341
360
               41.6%;
47.2%;
                                                         76681
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Keng T., Biemann K.,
 21;
                                                                  S -> Q (IN REF. 1).
A -> P (IN REF. 1).
DVH -> AAA (IN REF. 1).
ER -> DG (IN REF. 1).
L -> D (IN REF. 1).
L -> V (IN REF. 1).
                Pred. No.
                           Score 248.5;
                                                         DDA27FF5DBC4BE3B
 Mismatches
               .9e-13;
                            DB 1;
 44;
                                                         CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    of proteins
 Indels
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Gaps
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1 LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGE-VNESLLQQDEEKALYAAAQGLQP 59

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RESULT
SYGB_CO
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                                       Вþ
         Qγ
                                                                                                             Best
                                                                                                                           Query Match
                                                                                                 Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SYGB_COXBU
P45651;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Coxiella group;
NCBI_TaxID=777;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Coxiella burnetii.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Glycyl-tRNA
                                                                                                                                                                                                                                                                                     use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                   the
                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   <del>-</del>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Unpublished observations (AUG-1995).
-!- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) = AMP +
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bairoch
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Williams J.C.; "Cloning and characterization of an autonomous
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STRAIN-Nine Mile phase I / Bratislava; MEDLINE-94350801; PubMed-8071197; Suhan M., Chen S.Y., Thompson H.A., Ho
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          beta chain)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-NOV-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-NOV-1995
                                                                                                                                                                                                               EMBL; U10529; AAA56913.1; ALT_FRAME. InterPro; IPRO021106; AAKIRA_ligaseII. InterPro; IPRO02311; tRNA_synt_5. Pfam; PF02092; tRNA_synt_2f; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    15-JUN-2002
                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CONCEPTUAL TRANSLATION.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       683
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 623
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      563 MKAVSHFRTLDAAAALAAANKRVSNILAKSDEVLSDRVNASTLKEPEEIKLAMQVVVVLRD
                                                                                                                                                                                   Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase;
                                                                                                                                                                                                     PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             σ
                                       160
• 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 om Coxiella burnetii.";
Bacteriol. 176:5233-5243(1994).
                                                                                                             Local
                                                                    بر
                                                                                                                                                                                                                                                                                                                                                                                                                        SUBCELLULAR LOCATION: CYTOPLASMIC.
SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
CAUTION: THIS IS A CONCEPTUAL TRANSLATION; THREE FRAMESHIFTS WERE
INTRODUCED TO MAXIMIZE THE SIMILARITY WITH ORTHOLOGS IN OTHER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                + glycyl-trna(Gly).
SUBUNIT: TETRAMER OF TWO ALPHA AND TWO BETA CHAINS
                                                                                                                                                                                                                                                                                                                                                  European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DISLL
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Coxiella
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DIALL
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          IAAAVAEGNERTALSELASVKPQVDAFEDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVAD 120
                                                                    LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPK
                                       IKAVQHFQTLPEADALAAANKRVSNILKKQAAELKSIDHSLFDSDAEHLLADQLKERAEL 219
                                                                                                               Similarity
                                                                                                                                                                                                     PS50861; AA_TRNA_LIGASE_II_GLYAB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          687
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (Rel. 32, Created)
(Rel. 32, Last sequence update)
(Rel. 41, Last annotation update)
synthetase beta chain (EC 6.1.1.14)
(GlyRS) (Fragment).
                                                                                                                                                        284 AA;
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                                                                                                                                                         32048 MW;
                                                                                                               44.48;
                                                                                                                           39.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              gamma
                                                                                                 21;
                                                                                               Score 238; DB 1;
Pred. No. 5.3e-13;
1; Mismatches 48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRT;
                                                                                                                                                           3B76C8421076FF11 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                subdivision; Legionellaceae group;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Hoover T.A., Hill A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   284
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                                                                                                  48;
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                                                                                                                            Length 284;
                                                                                                    Indels
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SYGB_XYLFA RESULT 8

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Best Local (
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16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Glycyl-tRNA synthetase beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PASMU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            May B.J., Zhang Q., Li L.L., Paustian M.L., Whittam T.S., Kapur V.; "Complete genomic sequence of Pasteurella multocida Pm70."; Proc. Natl. Acad. Sci. U.S.A. 98:3460-3465(2001).
-i- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) = AMP + diphosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GLYS OR PM1102
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the European Bioinformatics Institute. There are no rest
use by non-profit institutions as long as its content
modified and this statement is not removed. Usage by ar
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pasteurella multocida
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        beta chain)
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                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro; IPR002311; tRNA_synt_2f.
Pfam; PF02092; tRNA_synt_2f; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMBL; AE006151; AAK03186.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 + glycyl-tRNA(Gly)
-!- SUBUNIT: TETRAMER |
SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDLINE=21145866; PubMed=11248100; May B.J., Zhang Q., Li L.L., Paustian M.L.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pasteurella
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase; ATP-binding;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TIGRFAMs;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 - !- SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRINTS; PR01045; TRNASYNTHGB.
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684
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUBCELLULAR LOCATION: Cytoplasmic.
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DISLL
                                                      DIALL 124
                                                                                                                                                         KIAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVA 119
                                                                                                                                                                                                                  VRAVSHFRALEAAEALAAANKRVSNILAKVEGELPANIDTTLCAEAAEKVLAEQVIALQA 623
                                                                                                         ELAPLFAKGEYQVALDRLAALREPVDTFFDNVMVNAENPQLRQNRLAILNNLRNLFLQVA
                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ; TIGR00211; glyS; 1.
PS50861; AA_TRNA_LIGASE_II_GLYAB;
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                                                                                                                                                                                                                                                                                                                                                                                                                                           689 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (GlyRS).
                                                                                                                                                                                                                                                                                                                            Conservative
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                                                                                                                                                                                                                                                                                                                                                        38.7%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   gamma subdivision; Pasteurellaceae;
                                                                                                                                                                                                                                                                                                                                                        Score 231.5;
Pred. No. 4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
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                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           689
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                                                                                                                                                                                                                                                                                                                                                              4.8e-12;
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                                                                                                                                                                                                                                                                                                                                    47;
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RA Alvarenga R., Alves L.M.C., Araya J.E., Baia G.S., Baptista C.S., Ra Alvarenga R., Alves L.M.C., Araya J.E., Baia G.S., Baptista C.S., RA Barros M.H., Bonaccorsi E.D., Bordin S., Bove J.M., Briones M.R.S., Ra Barros M.H., Bonaccorsi E.D., Bordin S., Bove J.M., Briones M.R.S., Ra Bueno M.R.P., Camargo A.A., Camargo L.E.A., Carraro D.M., Carrer H., Colauto N.B., Colombo C., Costa F.F., Costa M.C.R., Costa-Neto C.M., Ra Coulutho L.L., Cristofani M., Dias-Neto E., Docena C., El-Dorry H., Facincani A.P., Ferreira A.J.S., Ferreira V.C.A., Ferro J.A., Ra Fraga J.S., Franca S.C., Franco M.C., Frohme M., Furlan L.R., Ra Fraga J.S., Franca S.C., Franco M.C., Frohme M., Furlan L.R., Ra Fraga J.S., Kuramae E.E., Laigret F., Lambais M.R., Leite L.C.C., Ra Lemos E.G.M., Lemos M.V.F., Lopes S.A., Lopes C.R., Machado J.A., Ra Machado M.A., Madeira A.M.B.N., Madeira H.M.F., Mathais M.R., Leite L.C.C., Ra Marques M.V., Martins E.A.L., Martins E.M.F., Matsukuma A.Y., Marques M.V., Martins E.A.L., Martins E.M.F., Matsukuma A.Y., Ra Mannek C.F.M., Nascimento A.L.T.O., Netto L.E.S., Ra Peixoto B.R., Poereira G.A.G., Pereira H.A. J., Pesquero J.B., Paris A., Pereira M.C., de Oliveira R.C., Palmieri D.A., Paris A., Pa Peixoto B.R., Roberto P.G., Rodrigues V., de Rosa A.J.M., Ra de Silva A.C.R., de Salvestri M.L.Z., Siqueira M.J., de Souza A.A., Ra de Souza A.P., Terenzi M.F., Truffi D., Tsai S.M., Tsuhako M.H., Ra Gason M.S., Verjovski-Almeida S., Vettore A.L., Ra Zago M.A., Zatz M., Meidanis J., Setubal J.C.;

"The genome sequence of the plant pathogen Xylella fastidiosa.";

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Q9PC26;
16-OCT-2001
16-OCT-2001
                                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed. entities requires a license agreement (See
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16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
16-OCT-2001 (Rel. 40, Last annotation update)
Glycyl-trna synthetase beta chain (EC 6.1.1.14) (Glycine--trna ligase
                                                                                                                                                                                                                                                           EMBL; AE004015; AAF84761.1;
                                                                                                                                                                                                                                                                                                     or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       beta chain)
                                                                                                                          PRINTS; PRO1045; TRNASYNTHGB.
TIGREAMS; TIGRO0211; 919S; 1.
PROSITE; PS50861; AA TRNA_LIGASE_II_GLYAB; 1.
Aminoacyl-trNA synthetase; Protein biosynthesis; Ligase;
                                                                                                                                                                      PRINTS; PR01045; TIGRFAMS; TIGRF002
                                                                                                                                                                                                               InterPro; IPR002311; tRNA_synt_2f.
Pfam; PF02092; tRNA_synt_2f; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Xylella fastidiosa.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             SUBCELLULAR LOCATION: Cytoplasmic.
SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      + glycyl-trna(Gly).
SUBUNIT: TETRAMER OF TWO ALPHA AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) =
                                                                                                                                                                                                                                                                                                                                                                                                       SWISS-PROT entry is copyright. It is produced through en the Swiss Institute of Bioinformatics and the EM
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                          Similarity
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722 AA;
    Conservative
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                                                                                      80149 MW;
                        41.08;
                                            35.2%;
    23;
                        Score 210.5;
Pred. No. 2.
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    Mismatches
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There are no restrictions on ong as its content is in no
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                        2.8e-10;
                                          DB 1;
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SYGB_THEMA
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                                                                Matches
                                                                             Query Match
Best Local
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Melson K.E., Clayton R.A., Gill S.R., Gwinn M.L., Dodson R.J.,
Haft D.H., Hickey E.K., Peterson J.D., Nelson W.C., Ketchum K.A.,
Haft D.H., Utterback T.R., Malek J.A., Linher K.D., Garrett M.M.,
Stewart A.M., Cotton M.D., Pratt M.S., Phillips C.A., Richardson D.Heidelberg J., Sutton G.G., Fleischmann R.D., Eisen J.A., White O.,
Salzberg S.L., Smith H.O., Venter J.C., Fraser C.M.;
Evidence for lateral gene transfer between Archaea and Bacteria frogenome sequence of Thermotoga maritima.",
Nature 399:23-329(1999)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         O9WY60;
16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence update)
16-OCT-2001 (Rel. 40, Last annotation update)
Glycyl-tRNA synthetase beta chain (EC 6.1.1.14)
                                                                                                                                                                                                                                                                                              use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                     EMBL; AE001706; AAD35309.1; TIGR; TM0217; -.
                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Thermotogae; Ther
Thermotogaceae; Thermotoga
                                                                                                                                                                                                       PRINTS; PR01045; TRNASYNTHGB.
                                                                                                                                                                                                                         Pfam; PF02092;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -!- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) = AMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-MSB8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SYGB_THEMA
                                                                                                                                                          Aminoacyl-tRNA synthetase;
                                                                                                                                                                           PROSITE;
                                                                                                                                                                                                                                         InterPro;
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546 EALQEISEKPEFQDLFVGFERVHNITKNHDST--KFDGALFEKEEEKKLMNKFYEVKEKV 603
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                                                                             Local Similarity
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                           2 QAVAVFKQLPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPKI 61
                                                                                                                                                                                                                                                                                                                                                                                                                             SUBCELLULAR LOCATION:
SIMILARITY: BELONGS TO
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              + glycyl-tRNA(Gly)
SUBUNIT: TETRAMER (
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                                                                                                                         proteome.
672 AA;
                                                                                                                                                                    ps50861; AA_TRNA_LIGASE_II_GLYAB;
                                                                                                                                                                                                                       IPR002311; tRNA_synt_2f.
2092; tRNA_synt_2f; 1.
                                                                Conservative
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                                                                                                                         77813 MW;
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                                                                                                                                                                                                                                                                                                                                                                                                                                               Cytoplasmic
                                                                                                                                                       Protein biosynthesis; Ligase;
                                                              26;
                                                                             Score 151;
Pred. No. 2.
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                                                            Mismatches
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16-CCT-2001 (Rel. 40, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update)
Glycyl-tRNA synthetase beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "The genome sequence of Rickettsia prowazekii and the origin of mitochondria.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=99039499; PubMed=9823893; Andersson J.O., Andersson S.G.E., Zomorodipour A., Andersson J.O., Sicheritz-Ponten T., Alsmark U.C.M., Podowski R.M., Naeslund A.K., Eriksson A.-S., Winkler H.H., Kurland C.G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Rickettsiaceae; Rickettsieae; NCBI_TaxID=782;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GLYS OR RP849.
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InterPro; IPR002311; tRNA_synt_2f;
Pfam; PF02092; tRNA_synt_2f; 1.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TIGRFAMS; TIGR00211; glyS; 1.
PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                               Complete proteome
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRINTS; PR01045;
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                                                             76
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          + glycyl-tRNA(Gly).
SUBUNIT: TETRAMER OF TWO ALPHA AND
(BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SUBCELLULAR LOCATION: Cytoplasmic. SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
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CATALYTIC ACTIVITY: ATP + glycine + trna(Gly) = AMP + trna(Gly) = trna(Gly) 
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                                                         ELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMNAVADIALL 124
                                                                                                                                                                                           LAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPKIAAAVAEGNFRTALS 75
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LLSSLLKPITSFFDNVLVNDSDPKIAQNRLSLLQNTCEVFDKVAKFCRL
                                                                                                                             LINAYKRVSNIMGN-QKITGLVDASLFSTQYEKELFEVIQKISQQIIVIIANKDYQKALN 616
                                                                                                                                                                                                                                                                                              Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                    76215 MW;
                                                                                                                                                                                                                                                                                                 23.2%;
                                                                                                                                                                                                                                                                  19;
                                                                                                                                                                                                                                                           Score 138.5; DB 1;
Pred. No. 0.00024;
""matches 53;
                                                                                                                                                                                                                                                                                                                                                                                                    A193D931CE7463F5 CRC64;
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RESULT 11

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RA Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
RA Borriss R., Boursier L., Brans A., Braum M., Brignell S.C., Bron S.,
RA Brouillet S., Bruschl C.V., Caldwell B., Capuano V., Carter N.M.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Chim S.Y., Glaser P., Goffeau A., Galizzi A., Galleron N.,
RA Guiseppi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Joris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Lee S.M., Levine A., Liu H., Masuda S., Mauel C., Medigue C.,
RA Medina N., Mellado R.P., Mizuno M., Moesti D., Nakai S., Noback M.,
RA Noone D., O'Reilly M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
RA Rieger M., Rivolta C., Rocha E., Roche B., Roche B., Prescott A.M.,
RA Rieger M., Tanconi E., Takagi T., Takahashi H., Takemaru K.,
RA Sato T., Scanlan E., Schletch S., Schroeter R., Scoffone F.,
RA Sato T., Scanlan E., Schletch S., Schroeter R., Scoffone F.,
RA Sekiyuchi M., Tanakoshi A., Tanaka T., Tarahashi H., Takemaru K.,
RA Takeuchi M., Tanakoshi A., Tanaka T., Tarahashi H., Takemaru K.,
RA Yoshida K., Yoshikawa H.F., Zumstein E., Yoshikawa H., Danchin A.,
The complete genome sequence of the Gram-positive bacterium Bacillus
The complete genome sequence of the Gram-positive bacterium Bacillus
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01-OCT-1996
15-JUN-2002
Glycyl-trnA
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MEDLINE=97124195; P
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Bacteria; Firmicutes;
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                                                                                                                          use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                              + glycyl-trna(Gly).
-i- SUBUNIT: TETRAMER OF TWO ALPHA AND TWO BETA CHAINS.
-i- SUBCELLULAR LOCATION: Cytoplasmic.
-i- SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Nature 390:249-256(1997).
-i- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) - AMP + diphosphate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE-98044033; PubMed-9384377;
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                                                                                                     or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                       the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                       SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
   D84432;
299116;
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(Rel. 34, Last sequence update)
(Rel. 41, Last annotation update)
synthetase beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
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       BAA12485.1;
CAB14455.1;
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S., Takemaru K.-I., Hosono S.,
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SubtiList; BG11658; g1yS.
InterPro; IPR002311; tRNA_synt_2f.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam; PF02092; tRNA_synt_2f; 1.
PRINTS; PR01045; TRNASYNTHOB.
TIGRAMS; TIGR00211; 91y5; 1.
PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.
Aminoacy1-ERNA_synthetase; Protein biosynthesis; Ligase; ATP-binding;
                                                                                                                                                                      the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 beta chain) (GlyRS).
GLYS OR AQ_2141.
Aquifex aeolicus.
 SEQUENCE
                          TIGRFAMS; TIGRO0211; glyS; 1.

PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.

Aminoacyl-trna synthetase; Protein biosynthesis; Ligase;
                                                                           EMBL; AE000775; AAC07870.1; -.
InterPro; IPRO0331; tRNA_synt_2f; 1.
Pfam; PF02092; tRNA_synt_2f; 1.
PRINTS; PR01045; TRNASYNTHGB.
                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation
                                                                                                                                                                                                                                                                                                                                                              Nature 392:353-358(1998).
-!- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) = AMP +
                                                                                                                                                                                                                                                                                                                                                                                                                    Deckert G., Warren P.V., Gaasterland T., Young W.G., Lenox A.L., Graham D.E., Overbeek R., Snead M.A., Keller M., Aujay M., Huber Feldman R.A., Short J.M., Olson G.J., Swanson R.V.; "The complete genome of the hyperthermophilic bacterium Aquifex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Glycyl-tRNA synthetase beta
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16-0CT-2001
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                                                                                                                                                            or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                     + glycyl-trna(Gly).
SUBUNIT: TETRAMER OF TWO ALPHA AND TWO BETA CHAINS
                                                                                                                                                                                                                                                                                      SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
                                                                                                                                                                                                                                                                                                      SUBCELLULAR LOCATION: Cytoplasmic.
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                proteome
 664 AA;
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synthetase beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
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Pred. No. 0.00027;
1; Mismatches 45
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                              ATP-binding;
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                                                                                                                                                                                                                                                                                                  the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                             InterPro; IPR002311; tRNA_synt_2f. Pfam; PF02092; tRNA_synt_2f; 1. PRINTS; PR01045; TRNASYNTHGB.
                                                                                                                                                                                TIGRFAMS; TIGR00211; glyS; 1.
PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.
Aminoacyl-trNa_synthetase; Protein biosynthesis; Ligase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         halodurans and genomic sequence comparison with Bacillus Nucleic Acids Res. 28:4317-4331(2000).
-!- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) - AMP
                                                                                                                                                        SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                    This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Takami H., Nakasone K., Takaki Y., Maeno G., S
Fuji F., Hirama C., Nakamura Y., Ogasawara N.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=C-125 / JCM 9153;
MEDLINE=20512582; PubMed=11058132;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=86665;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bacillus halodurans.
Bacteria; Firmicutes;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           'Complete genome sequence of the alkaliphilic bacterium
                                564 VFKKAKLLVSKVNTPEFKELVEGLSRVTNIAGKAEKNVA-INPDLFEKEEERVLYEAYVQ 622
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SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
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                                                           VFKQ------LPEAAALAAANKRVQNLLKKADAALGEVNESLLQQDEEKALYAAAQG 56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (BY SIMILARITY)
LQPKIAAAVAEGNFRTALSELASVKPQVDAFFDGVMVMAEDAAVKQNRLNLLNRLAEQMN 116
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35; Conserv
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(Rel. 40, Last sequence update)
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synthetase beta chain (EC 6.1.)
                                                                                           Conservative
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                                                                                              Score 137; Ub 1,
No. 0.00034;
                                                                                         Pred. No. 0.005; Mismatches
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Pred. No. 0
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      DE DIT AC
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Best Local S
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Q55690;
Q1-NOV-1997
Q1-NOV-1997
16-OCT-2001
SYGB_BUCAI
p57235;
16-OCT-2001
16-OCT-2001
16-OCT-2001
Glycyl-tRNA
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DNA Res. 2:153-166(1995).
-I- CATALYTIC ACTIVITY: ATP + glycine + tRNA(Gly) = AMP + dinhosnhama
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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Bacteria; Cyanobacteria; Chroococcales; Synechocystis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Complete proteome. SEQUENCE 722 AA;
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PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.

Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase; ATP-binding;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        InterPro; IPR002311; tRNA_synt_2f.
Pfam; PF02092; tRNA_synt_2f; 1.
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Kaneko T., Tanaka A., Sato S., Kotani H., Sazuka T., Miyajima
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SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
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31; Conserv
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(Rel. 35, Last sequence update)
(Rel. 40, Last annotation update)
synthetase beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
(Rel. 40, Created)
(Rel. 40, Last sequence update)
(Rel. 40, Last annotation update)
synthetase beta chain (EC 6.1.1.14) (Glycine--tRNA ligase
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-!- SUBUNIT: TETRAMER (
(BY SIMILARITY).
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Nature 407:81-86(2000).
-i- CATALTTIC ACTIVITY: ATP + glycine + trNa(Gly) = AMP + diphosphate
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Bacteria; Proteobacteria; gamma subdivision; Buchnera
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Interpro; IPR02331; tRNA_Synt_2f;
Pfam; PF02092; tRNA_Synt_Zf; 1.
PRINTS; PR01045; TRNASYNTHGB.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Aminoacyl-tRNA synthetase; Protein biosynthesis; Ligase; ATP-binding;
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PROSITE; PS50861; AA_TRNA_LIGASE_II_GLYAB; 1.
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use by non-profit institutions as long as its content
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-i- SIMILARITY: BELONGS TO CLASS-II AMINOACYL-TRNA SYNTHETASE FAMILY.
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Q51114 neisseria m
Q51213 ralstonia s
Q8y213 ralstonia s
Q9i7bB pseudomonas
Q8xdn7 escherichia pe
Q8z196 salmoneila
Q8z296 salmoneila
Q9f730 pseudomonas
Q9f30 pseudomonas
Q9f326 neisseria m
Q8uhn6 agrobacteri
Q9gk0 lactococcus
Q97pw6 streptococc
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ALIGNMENTS

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Best Local Similarity
Matches 121; Conserv
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Q1-OCT-2000
01-OCT-2000
01-JUN-2002
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                                                                                                                                                  Interpro; IPR002311; tRNA_Synt_2f.
pfam; pF02092; tRNA_Synt_2f; 1.
prints; pr01045; TRNASYNTHGB.
TIGRERAMS; TIGR00211; 91yS; 1.
Aminoacyl-tRNA synthetase; Complete proteome.
SEQUENCE 687 AA; 74573 MW; 616BCBDD76A3D4FB CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Glycyl-tRNA
NMB1930.
                                                                                                                                                                                                                                                                                                                                                                                Science 287:1809-1815(2000).
EMBL; AE002541; AAF42259.1;
TIGR; NMB1930; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           "Complete genome sequence MC58.";
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STRAIN=MC58 / SEROGROUP B;
MEDLINE=20175755; PubMed=10710307;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Neisseria meningitidis (serogroup B).
Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
NCBI_TaxID=491;
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0 (TrEMBLrel. 15, L
2 (TrEMBLrel. 21, L
A synthetase, beta
       Conservative
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Last annotation update)
a chain.
   Score 575; DB 16;
Pred. No. 5.6e-39;
2; M1smatches 3;
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Best Local S
Matches 121
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Q9JW67;
Q1-OCT-2000
01-NOV-1996
01-NOV-1996
01-JUN-2002
Glycyl tRNA
GLYS.
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Q51114;
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"Complete DNA sequence of a serogroup A strain of Neisseria"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Putative glycyl-tRNA synthetase beta GLYS OR NMA0523.
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01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TIGREAMS; TIGR00211; glyS; 1.

Aminoacyl-trNA synthetase; Ligase; Complete proteome.
SEQUENCE 687 AA; 74650 MW; 8C17811D5C93EBE3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nature 404:502-506(2000).

EMBL, AL162753; CAB83815.1; -.

InterPro; IPR002311; tRNA_Synt_2f.

Pfam; PF02092; tRNA_Synt_2f; 1.

PRINTS; PR01045; TRNASYNTHOB.
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MEDLINE=20222556; PubMed=10761919;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
STRAIN=Z2491 / SEF
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Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria
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                                         synthetase
                                                                                                                                                          PRELIMINARY;
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. 01, Last sequence up
. 21, Last annotation
(Fragment).
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RESULT 4
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Best Local S
Matches 85
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"Molecular analysis of a locus for the biosynthesis and phase-variable expression of the lacto-N-neotetraose terminal lipopolysaccharide structure in Neisseria meningitidis.";
Mol. Microbiol. 18:729-740(1995).
                                                                                                                                                                                                                                                                 Salanoubat M., Genin S., Arriguenave F., Gouzy J., Mangenot S., Arlat M., Billault A., Brottier P., Camus J.C., Cattolico L., Chandler M., Choisne N., Claudel Renard C., Cunnac S., Demange N., Gaspin C., Lavie M., Moisan A., Robert C., Saurin W., Schiex T., Siguier P., Thebault P., Whalen M., Wincker P., Levy M., Weissenbach J., Boucher C.A.; "Genome sequence of the plant pathogen Ralstonia solanacearum."; Nature 415:497-502(2002).
EMBL; AL646059; CAD14053.1; -.
InterPro; IPR002311; tRNA_synt_2f.
Pfan; PF02092; tRNA_synt_2f.
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01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Probable glycyl-tRNA synthetase beta chain protein
GLYS OR RSC6524 OR RSC4944.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Q8Y213
Q8Y213;
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Bacteria; Proteobacteria; beta subdivision; Neisseriaceae; Neisseria.
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Submitted (MAR-1997) to th
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Bacteria; Proteobacteria; beta subdivision; Ralst
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                                                                                                                                         Ligase; Complete proteome. SEQUENCE 697 AA; 75257 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=21681879; PubMed=11823852;
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                                                                                                                                                                                                                                           PRINTS; PR01045; TRNASYNTHGB
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97.7%;
                                    52.3%;
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EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2;
                                       Score
Pred.
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Pred. No. 2.
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                                       313;
No. 1
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.2e-26;
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                                       DB 16;
.5e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Ralstonia
          39;
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XC STRRIN=ATCC 15692 / PAO1;

XX MEDLINE=20437337; PubMed=10984043;

XX MEDLINE=20437337; PubMed=10984043;

XX Stover C.K., Pham X.-Q.T., Ervin A.L., Mizoguchi S.D., Warrener P.,

RA Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M.,

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RA Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Kowalik D.J., Kowalik D.J., Lagrou M.,

RA Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Lagrou M.,

RA Hickey M.J., Brinkman F.S.L., Hufnagle W.O., Kowalik D.J., Kowalik D.J.
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Best Local s
Matches 61
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Q91788;
Q1-MAR-2001;
Q1-MAR-2001;
Q1-JUN-2002;
OBXDN7:
01-MAR-2002 (TrEMBLrel. 20, Created)
01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Glycine tRNA synthetase, beta subunit.
GLYS OR Z4983 OR ECS44442.
                                                                                                                            Q8XDN7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Aminoacyl-tRNA synthetase; Complete proteome.
SEQUENCE 684 AA; 73973 MW; 74144075010F0BE6 CRC64;
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Last annotation update)
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0; Mismatches
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Pred. No. 6.2
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P SEQUENCE FROM N.A.

P SEQUENCE FROM N.A.

C STRAIN-0157:H7 / RIMD 0509952;

X MEDLINE-21156231; PubMed-11258796;

XA Hayashi T., Makino K., Ohnishi M., Kurokawa K., Ishii K., Yokoyama K.,

RA Han C.-G., Ohtsubo E., Nakayama K., Murata T., Tanaka M., Tobe T.,

RA Lida T., Takami H., Honda T., Sasakawa C., Ogasawara N., Yasunaga T.,

RA Kuhara S., Shiba T., Hattori M., Shinagawa H.;

RT Complete genome sequence of enterohemorrhagic Escherichia coli

RT 0157:H7 and genomic comparison with a laboratory strain K-12.";

RL DNA Res. 8:11-22(2001).

DR EMBL; AE005582; AAG58707.1; -.

DR EMBL; AE005558; BAB37865.1; -.

DR EMBL; AP002565; BAB37865.1; -.

DR InterPro; IPR002311; tRNA_synt_2f; 1.
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Best Local
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Q8Z9W7;
01-MAR-2002 (TIEMBLITE1. 2
01-MAR-2002 (TIEMBLITE1. 2
01-JUN-2002 (TIEMBLITE1. 2
SEQUENCE FROM N.A.
STRAIN-CO-92 / BIOVAR ORIENTALIS;
MEDLINE-21470413; PubMed-11586360;
Parkhill J., Wren B.W., Thomson N.R., Titball R.W., Holden M.T.
Prentice M.B., Sebaihia M., James K.D., Churcher C., Mungall K.
Baker S., Basham D., Bentley S.D., Brooks K., Cerdeno-Tarraga
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Perna N.T., Plunkett G. III, Burland V., Mau B., Glasner J.D., Rose D.J., Mayhew G:F., Evans P.S., Gregor J., Kirkpatrick H.A., Posfai G., Hackett J., Klink S., Boutin A., Shao Y., Miller L., Grotbeck E.J., Davis N.W., Lim A., Dimalanta E.T., Potamousis K., Apodaca J., Anantharaman T.S., Lin J., Yen G., Schwartz D.C., Welch B. A., Blatter B. B., Lin J., Yen G., Schwartz D.C.,
                                                                                                                                                                          Glycyl-tRNA synthetase GLYS OR YPO4071.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TIGRFAMS; TIGR00211; glyS; 1.
Aminoacyl-tRNA synthetase; Complete
SEQUENCE 689 AA; 76813 MW; 3F9BS
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[2]
                                                                                                                                             Bacteria;
                                                                                                                                                              Yersinia
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MEDLINE=21074935; PubMed=11206551;
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                                                                                                              NCBI_TaxID=632;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   "Genome sequence of enterohaemorrhagic Escherichia coli 0157:H7.";
Nature 409:529-533(2001).
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                                                                                                                                                                                                                                                                                                                                                                                DIALL 124
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                                                                                                                                                                                                                                                                                                                                                                                                              KLEPYFAEGRYQDALVELAELREPVDAFFDKVMVMVDDKELRINRLTMLEKLRELFLRVA
                                                                                                                                                          pestis
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48.0%;
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                                                                                                                                             gamma subdivision; Enterobacteriaceae;
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Last annotation update)
subunit (EC 6.1.1.14).
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Pred. No. 1.3e-12;
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3F9B939FEA3168CD CRC64;
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Holden M.T.G.,
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Best Local S
Matches 58
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A Feltwell T., Hamlin N., Holroyd S., Jagels K., Karlyshev A.V.,
A Leather S., Moule S., Oyston P.C.F., Quail M., Rutherford K.,
Simmonds M., Skelton J., Stevens K., Whitehead S., Barrell B.G.;
T "Genome sequence of Yersinia pestis, the causative agent of plagu
L Nature 413:523-527(2001).
R EMBL; AJ414160; CAC93524.1; -.
R InterPro; IPR00331; TRNA_synt_2f.
R InterPro; IPR00331; TRNA_synt_2f.
R Pfam; PF02092; tRNA_synt_2f; 1.
R Pfam; PF02092; tRNA_Synt_3f; 1.
R PFINTS; PR01045; TRNASYNTHGB.
R PRINTS; TIGR00211; glyS; 1.
R TIGRPAMS; TIGR00211; glyS; 1.
R Aminoacyl-tRNA synthetase; Ligase; Complete proteome.
SEQUENCE 689 AA; 76204 MW; 715AFZAE0D639397 CRC64;
                                                                                            Matches
                                                                                                        Query Match
Best Local
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Q8ZL96;
Q1-MAR-2002 (TrEMBLrel. 2
Q1-MAR-2002 (TrEMBLrel. 2
Q1-JUN-2002 (TrEMBLrel. 2
Glycine tRNA synthetase,
GLYS OR STM3655.
                                                                                                                                                                                                                                                                                                      McClelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Layman D., Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulvaney E., Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M., Waterston R., Wilson R.K.;
                                                                                                                                                      TIGRFAMS; TIGR00211; glyS; 1.
Aminoacyl-tRNA synthetase; LisseQUENCE 689 AA; 76452 MW;
                                                                                                                                                                                                Nature 413:852-856(2001).

EMBL; AE008869; AAL22314.1; -.

InterPro; IPR002311; tRNA_Synt_2f.

Pfam; PF02092; tRNA_Synt_2f; 1.

PRINTS; PR01045; TRNASYNTHGB.
                                                                                                                                                                                                                                                                                                                                                                               STRAIN=LT2 / SGSC1412 / ATCC 700720;
MEDLINE=21534948; PubMed=11677609;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                            Salmonella
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KIAAAVAEGNERTALSELASVKPQVDAFFDGVMYMAEDAAVKQNRLNLLNRLAEQMNAVA 119
                               LQAVAVFKQLPEAAALAAANKRVQNLLKKADAALGE-VNESLLQQDEEKALYAAAQGLQP 59
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46.48;
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20, Last sequence update)
21, Last annotation update)
21, Last annotation date)
, beta subunit (EC 6.1.1.14).
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Pred. No. 1.1
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Pred. No. 1e-
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1.1e-11;
ches 43; Indels
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Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Glycine-tRNA synthetase,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-MAR-2002
01-JUN-2002
                                                                                                                                                                                                                                                                                                                                                                                              PRINTS; PRO1045; TRNAŠYNTHGB.
TIGGFAMS; TIGRO0211; 91YS; 1.
Aminoacyl-trNa synthetase; Ligase;
SEQUENCE 689 AA; 76645 MW; A93C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "Complete genome sequence of a multiple drug resistant Salmonella enterica serovar Typhi CT18.";
Nature 413:848-852(2001).
EMBL; AL627281; CAD07973.1; -.
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                                    GlyS-like protein (Fragment). Pseudomonas fluorescens.
                                                             Q9F730
Q9F730;
O1-MAR-2001 (TrEMBLrel. 16,
01-MAR-2001 (TrEMBLrel. 16,
01-JUN.2001 (TrEMBLrel. 17,
                                                                                                                                                                                                                                                                                                                                                                                                                                  InterPro; IPR002311; tRNA_synt_2f; pfam; PF02092; tRNA_synt_2f; 1.
PRINTS; PR01045; TRNASYNTHGB.
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                        Bacteria; Proteobacteria;
NCBI_TaxID=294;
            Pseudomonas
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                                                                                                                                                                                                                                                                                                                                              56;
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(TrEMBLrel. 21, Last annotation
A synthetase, beta subunit (EC
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A93CC239351028D9 CRC64;
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                           subdivision; Pseudomonadaceae;
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Q8UHN6;
Q8UHN6;
01-JUN-2002
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Q932S6;
Q1-DEC-2001
Q1-DEC-2001
Q1-JUN-2002
                                                                                                                                                                                     STRAIN-M978, AND A1;
MEDLINE-21467954; PubMed-11583844;
MEDLINE-21467954; PubMed-11583844;
Zhu P., Klutch M.J., Tsai C.-M.;
"Genetic Analysis of Conservation and Variation of Lipooligosaccharide Expression in Two L8-Tamunotype Strains of Neisseria meningitidis.";
FEMS Microbiol. Lett. 203:173-177(2001).
EMBL; AF355193; AAL12837.1; -.
EMBL; AF355194; AAL12843.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Laue B.E., Jiang Y., Chhabra S.R., Jacob S., Stewart Hardman A., Downie J.A., O'Gara F., Williams P.; "The biocontrol strain Pseudomonas fluorescens F113 Rhizobium small bacteriocin, N-(3-hydroxy 7-cis-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Microbiology 146:2469-2480(2000).
EMBL; AF286536; AAG30824.1; -
InterPro; IPR002311; tRNA_Synt_2f.
Pfam; PF02092; tRNA_Synt_2f; 1.
                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A. STRAIN-M978, AND P
                                                                                                                                                                                                                                                                                                             Neisseria meningitidis.
Bacteria; Proteobacteria;
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acylhomoserine lactone synthase.";
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SEQUENCE FROM N.A.
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100.0%;
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Last annotation update)
                                                                                                                                  Score 193;
Pred. No.
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Pred. No. 7
                                                                                                                                                                  E41CA1A42B65A187 CRC64;
                        PRT;
                                                                                                                                                                                                                                                                                                           subdivision; Neisseriaceae; Neisseria.
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RESULT 13
Q986B
ID 0986B
AC Q986B
DT 01-0C
DT 01-0C
DT 01-UC
DT 01-JU
DE Glycy
GN MLR74
OS Rhizc
OC Bacte
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Q986B5;
01-OCT-2001
01-OCT-2001
01-JUN-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Wood D.W., Setubal J.C., Kaul R., Monks D.E., Kitajima J.P., Okura V.K., Zhou Y., Chen L., Wood G.E., Almeida N.F. Jr., Woo L., Chen Y., Paulsen I.T., Eisen J.A., Karp P.D., Bovee D. Sr., Chapman P., Clendenning J., Deatherage G., Gillet W., Grant C., Kutyavin T., Levy R., Li M.-J., McClelland E., Palmieri A., Raymond C., Rouse G., Saenphimmachak C., Wu Z., Romero P., Gordon Raymond S., Yoo H., Tao Y., Biddle P., Jung M., Krespan W., Perry M. Gordon-Kamm B., Liao L., Kim S., Hendrick C., Zhao Z.-Y., Dolan M. Chumley F., Tingey S.V., Tomb J.-F., Gordon M.P., Olson M.V., Mester E.W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Science [2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Genome sequence of the plant pathogen and biotechnolo Agrobacterium tumefaciens C58."; Science 294:2323-2328(2001).

EMBL; AE009032; AAL41660.1; --
EMBL; AE009938; AAK86451.1; --
EMBL; AE007998; AAK86451.1; --
Aminoacyl-trNA synthetase; Complete proteome.
SEQUENCE 717 AA; 78713 MW; 94F26877B8EF0A48 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Goodner B., Hinkle G., Gattung S., Miller N., Blanchard M., Qurollo B., Goldman B.S., Cao Y., Askenazi M., Halling C., Mullin Houmiel K., Gordon J., Vaudin M., Tartchouk O., Epp A., Liu F., Wollam C., Allinger M., Doughty D., Scott C., Lappas C., Markelz Flanagan C., Crowell C., Gurson J., Lomo C., Sear C., Strub G., Cielo C., Slater S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-JUN-2002 (TYEMBLEE). 21, Last sequence update)
01-JUN-2002 (TYEMBLEE]. 21, Last annotation update)
Glycyl-trna synthetase, beta chain.
GLYS OR ATU0644 OR AGR_C_1144.
                              Phyllobacteriaceae; NCBI_TaxID=381;
                                                                                                               Glycyl-tRNA
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 SEQUENCE FROM N.A
                                                                 Bacteria;
                                                                              Rhizobium loti (Mesorhizobium loti)
                                                                                                 MLR7435
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                                                                 Proteobacteria;
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1 (TrEMBLrel. 18, L
2 (TrEMBLrel. 21, L
A synthetase, beta
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Mesorhizobium.
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EMBL; AP00301; BAB53338.1; -.

InterPro; IPR002311; tRNA_Synt_2f.

Pfam; PF02092; tRNA_Synt_Zf; 1.

PRINTS; PR01045; TRNASYNTHOB.
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MEDLINE-21082930; PubMed-11214968;
Kåneko T., Nakamura Y., Sato S., Asamizu E., Kato T., Sasamoto Kanabe A., Idesawa K., Ishikawa A., Kawashima K., Kimura T., Kishida Y., Kiyokawa C., Kohara M., Matsumoto M., Matsuno A., Mochizuki Y., Nakayama S., Nakazaki N., Shimpo S., Sugimoto M. Takeuchi C., Yamada M., Tabata S.;
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Aminoacyl-tRNA synthetase; Complete proteome.
SEQUENCE 718 AA; 78610 MW; 6664029CFFA0C689 CRC64;
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O1-mAR-2002 (TrEMBLrel. 20,

O1-JUN-2002 (TrEMBLrel. 21,

O1-JUN-2002 (TrEMBLrel. 21,

Clycyl-tRNA synthetase beta
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MEDLINE=20020109; PubMed=11756688;
DelVecchio V.G., Kapatral V., Redkar R.J., Patra G., Mujer C., Los T.,
Ivanova N., Anderson I., Bhattacharyya A., Lykidis A., Reznik G.,
Jablonski L., Larsen N., D'Souza M., Bernal A., Mazur M., Goltsman E.,
Selkov E., Elzer P.H., Hagius S., O'Callaghan D., Letesson J.-J.,
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                                                                                                                                                                                                                                                                                              InterPro; IPR002311; tRNA_Synt_2f.
PfAm; PF02092; tRNA_Synt_2f; 1.
TIGR07211; glyS; 1.
Ligase; Complete proteome.
SEQUENCE 780 AA; 85795 MW; 279.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Haselkorn R., Kyrpides N., Overbeek R.; "The genome sequence of the facultative Brucella melitensis.";
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NCBI_TaxID=29459;
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chain (EC 6.1.1.14).
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Pred. No. 4.9e-06;
2; Mismatches 55;
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time :

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RESULT
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                                                                                                                                         Query Match
Best Local S
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X MEDLINE-21235186; PubMed=11337471;

A MeLssenbach J., Ehrlich S.D., Sorokin A.;

Welssenbach J., Ehrlich S.D., Sorokin A.;

"The complete genome sequence of the lactic acid bacterium lactic ssp. lactis IL1403.";

I cenome Res. 11:731-753(2001).

R EMBL; ABC06341; AAK05194.1; -.

R InterPro; IPR002311; tRNA_synt_2f.

R PIAWTS; PR01045; TRNA_SYNTHGB.

R PFIAWTS; PR01045; TRNA_SYNTHGB.

R PIGRFAMS; TIGR00211; g1yS; 1.

R PIGRFAMS; TIGR00211; g1yS; 1.

R AMINOACY1-TRNA synthetase; Complete proteome.

SEQUENCE 673 AA; 75717 MW; 99CF078804DAE69E CRC64;
                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   O9CGKO:
01-JUN-2001 (TrEMBLrel. 17, Created)
01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Glycyl-tRNA synthetase beta chain (EC 6.1.1.14).
GLYT OR LL1096.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Q9CGK0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Bacteria; Firmicutes;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Lactococcus lactis (subsp. lactis) (Streptococcus lactis).
Bacteria; Firmicutes; Bacillus/Clostridium group; Lactobacillales;
                                                                                                                                                                                                                                                                                                                                                                                           STRAIN-IL1403
                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                       Streptococcaceae; Lactococcus.
                                                                                                                                                                                                                                                                                                                                                                                                                                    NCBI_TaxID=1360;
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                                                                                                                            Local Similarity nes 38; Conserv
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                   NLVKKA-KDIKEINPTLFEEDAEEALYNVVISLQNQWTYMPGEEKFRAIVHSLA---PAI 630
                                                                                            NLLKKADAALGEVNESLLQQDEEKALYAAAQGLQPKIAAAVAEGNFRTALSELASVKPQV 84
ETFFESVMVMAEDLSVRDNRIALLSEVVALTSVMADFSLI
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                                                                                                                              Conservative
                                                                                                                                             27.4%; 38.0%;
                                                                                                                              21;
                                                                                                                            Score 164; DB
Pred. No. 2.2e
21; Mismatches
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                                                                                                                                .2e-05;
les 37;
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                                                                                                                                                             DB 16;
                                                                                                                                                                                                                                                                                                                                  acid bacterium Lactococcus
                                     124
                                                                                                                                                           Length 673;
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Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
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Maximum DB seq length: 2000000000
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       A_Geneseq_101002:*

1: /SIDS2/gcgdata/g
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1823
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SIDSZ/gcgdata/geneseq/geneseqp-embl/AA198 DAT: *

(SIDSZ/gcgdata/geneseq/geneseqp-embl/AA198 DAT: *

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/SIDS2/gcgdata/geneseq/geneseqp-emb1/AA1981.DAT:*
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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

SUMMARIES

10	9	00	7	o.	U	4	ω	Ν	1	Result No.
225	226.5	227	244	254.5	1046	1049	1709	1820	1823	Score
12.3	12.4	12.5	13.4	14.0	57.4	57.5	93.7	99.8	100.0	Query Match Length DB
298	334	278	50	274	337	337	346	348	348	Length
22	21	21	20	22	18	17	23	18	17	
AAB96313	AAY68963	AAY68976	AAW89330	AAG90151	AAW06579	AAR91314	AAU72923	AAW06576	AAR91311	ID
Putative glycosylt	Cps2K protein whic	Cps1K protein whic	Neisseria meningit	C glutamicum prote	Lipo-oligosacchari	N. gonorrhoeae gly	Neisseria meningit	Neisseria polyglyc	N. gonorrhoeae gly	Description

Streptococcus	AAW61236	19	281	•	175	45
S. pneumoniae	s	23	270		175	44
Streptoco	ω	19	270	•	175	43
Amino acid	AAY43773	21	322	•	177	42
Enzyme EPS7 which	7	21	322		177	41
Campyloba	AAY97202	21	389	•	179	40
C glutamicum	4	22	345	9.8	179	39
Streptococcus	AAY81720	21	328	•	181	38
Cps2J protein	AAY68962	21	332		183	37
Escherichia col	ABB52989	22	311		185.5	36
.Putative	AAB96485	22	350	•	189.5	35
Campylobacter	AAY97203	21	270		190	34
	AAY97213	21	302		190.5	33
S. pneumoniae	ABP54656	23	674	٠	191.5	32
Streptococcus	AAW61238	19	674	•	191.5	31
Amino acid sequenc	AAY43795	21	268	٠	193.5	30
Enzyme EPSH	AAY54093	21	268		193.5	29
CpslJ protein	AAY68975	21	322	10.7	194.5	28
Campyloba	AAY97206	21	301		195	27
P. multocida hyalu	AAY96212	21	702		200	26
Listeria monocyto	ABB48565	23	327	11.0	200.5	25
	AAB47427	22	329	11.2	205	24
Amino acid sequenc	AAY43800	21	336	11.4	207.5	23
Enzyme EPSM	AAY54098	21	336	11.4	207.5	22
P. multocida	AAY43099	21	972	11.4	208.5	21
Pasteurella	AAY06212	20	972	11.4	208.5	20
Pasteurella	AAM47336	23	965	٠	210	19
Pasteurella	33	23	965		210	18
-	21	21	965		210	17
d I	AAY68974	21	322	٠	210	16
	AAB47426	22	332		211	15
Amino acid sequenc	77	21	316	11.8	214.5	14
Enzyme EPS8 which	AAY54072	21	316	11.8	214.5	13
S.thermophilus	AAW22177	18	324	٢		12
S.thermophilus	AAW14078	18	324		•	11

ALIGNMENTS

RESULT 1
AAR91311

AAR91311;

AAR91311 standard; Protein; 348 AA.

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Nucleic acids encoding glycosyl transferase(s) - used in the diagnosis of infection with Neisseria and for the biosynthesis oligo:saccharide(s) {\bf r}
                                           WPI; 1996-200924/20.
N-PSDB; AAT14061.
                                                                                                                                                                                                                        Glycosyltransferase; lipo-oligosaccharide; lgt gene; LOS locus; vaccine.
                                                                                                                                                                                                                                                      N. gonorrhoeae glycosyltransferase LgtA.
                                                                           Gotschlich EC;
                                                                                                                   26-SEP-1994;
                                                                                                                                       25-SEP-1995;
                                                                                                                                                           04-APR-1996.
                                                                                                                                                                                WO9610086-A1.
                                                                                                                                                                                                    Neisseria gonorrhoeae strain F62
                                                                                                                                                                                                                                                                           09-JUL-1996
                                                                                              (UYRQ ) UNIV ROCKEFELLER.
                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                  94US-0312387
                                                                                                                                       95WO-US12317.
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Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5 Glycosyltransferases (AAR91311-15) are products of the lgt locus (AAR14061) of Neiserria gonorrhoeae strain F62. Glycosyltransferase LgtA (AAR91311) can be obtd. by expression of the lgtA coding sequence in recombinant host cells. A method for adding GalNAC or GlcNAC betal-3 to Gal comprises contacting a reaction mixture contg. activated GalNAC or GlcNAc to an acceptor moiety comprising a Gal residue in the presence of LgtA. Oligosaccharides can be produced that, when attached to non-toxic lipids, are useful for Neisseria vaccine prepn. Blood group core oligosaccharides, and mimics of lactor N-neotetrase, gangliosides and saccharide portions of globoglycollpids can also be produced using the enzymes.
                                                                                                                                                                                                                                                                                                               AAW06576 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                              21-MAR-1997
                                                                                                                                                                                                 N-acetylgalactosaminyl transferase; lipo-oligosaccharide
                                                                                                                                                                                                              Polyglycosyltransferase; N-acetylglucosaminyl transferase
                                                                                                                                                                                                                                       Neisseria
                                                                         07-JUN-1995;
                                                                                                                                                                         Neisseria
                                               (NEOS-) NEOSE TECHNOLOGIES INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121
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                                                                                                                                                                                                                                                                                                                                                                                                                                      QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
                                                                                                                                                                                                                                                                                                                                                                                                                         QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHETAQGT
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348; Conserv
                         SL,
                                                                                                                                                                         gonorrhoeae ATCC 33084.
                                                                                                                                                                                                                                     polyglycosyltransferase.
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                          Johnson KF,
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                                                                                                                                                                                                                                                                                                                 Protein;
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Pred. No. 3.2e-184;
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RESULT 3
AAU72923
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XX AAU7
AC AAU7
XX Neis
XX Weni
KW infe
XX Meis
XX Neis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               A novel polyglycosyltransferase (PGTase) (AAW06576) from Neisseria gonorrhoeae ATCC 33084 catalyses the stereospecific conjugation of 2 specific activated saccharide units (e.g. UDP-GalNac, UDP-GalNac, UDP-Gal) to specific acceptors having a galactose moiety at a non-reducing end. It is the first PGTase reported to be capable of transfer of more than one different saccharide moiety. The PGTase is encoded by nucleotides 445-1488 of a lipo-oligosaccharide gene (AAT49230). It can be produced in transformed host cells and used oligosaccharide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Transfer of at least 2 saccharide units using poly:glycosyl:transferase - isolated from N. gonorrhoeae, cata the addition of both GlcNac and GalNac disaccharide(s) units
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  N-PSDB;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       oligosaccharide prodn.
                                                                                                                                                                                                                                                                          AAU72923 standard;
                                                                                                                                                                                                                12-MAR-2002
                             08-MAY-2001;
                                                                                     WO200185772-A2
                                                                                                               Neisseria meningitidis
                                                                                                                                                          Meningitis; virulence; gene;
                                                                                                                                                                                    Neisseria meningitidis virulence protein
                                                                                                                                             infection;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                           DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KILAQAQNSGLIPSLNIGLDELAKSGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                                                                                                                                               PSGAWLDFAADGRMRRLFTLRQYFGILYRLIKNRRQARSDSAGKEQEI 348
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     al Similarity
347; Conserv
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                                                                                                                                          Gram-negative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             348 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fig 2A-C; 38pp; English.
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                                                                                                                                                                                                                  (first entry)
                             2001WO-GB02003
                                                                                                                                                                                                                                                                          Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99.8%;
99.7%;
                                                                                                                                             bacteria; antimicrobial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1820; DB 18;
Pred. No. 6.6e-184;
1; Mismatches 0;
                                                                                                                                                           antibacterial; vaccine; veterinary;
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08-MAY-2000; 2000GB-0011108

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RESULT 4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The invention relates to a peptide (I) encoded by an operon (II) of Neisseria meningitidis including virulence genes, or a related molecule having a 40% sequence similarity at the peptide or nucleotide level in a Gram-negative bacterium, or its functional fragment, for therapeutic or diagnostic use. (I) and (II) are useful in the manufacture of a medicament for treating or preventing a condition (e.g., meningitis) associated with infection by Neisseria or Gram-negative bacteria. The product is useful for veterinary treatment and in a screening assay for the identification of an antimicrobial drug. The vaccines have prophylactic applications. AAU72911-AAU73014 represent N. meningitidis
                                                                                                         N. gonorrhoeae
                                                                                                                                                                                                   AAR91314 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 4; Page 60-61; 423pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         New peptide encoded by operon including virulence genes meningitidis, useful as vaccine component for treating comeningitis and for identifying antimicrobial drug -
                             Neisseria
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                invention relates to a peptide (I) encoded by an
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
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)B; AAS97208.
                                                                                                                                                                                                                                                                                   PAGAWLDFAADGKMRRLFTMRQYFGILHRLIKNRRQARSDSAGKEQEI 346
                                                                                                                                                                                                                                                                                                              PSGAWLDFAADGRMRRLFTLRQYFGILYRLIKNRRQARSDSAGKEQEI
                                                                                                                                                                                                                                                                                                                                                            QKTARNDELQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LQPLVSVLICAYNVEKYFAQSLATVVNQTWRNLEILIVDDGSTDGTLAIAKDFQKRDSRI
                                                                                                                                                                                                                                                                                                                                             QKTARNDFLQSMGFKTRFDSLEYRQIKAVAYELLEKHLPEEDFERARRFLYQCFKRTDTP
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                             gonorrhoeae
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                                                                                                                                        (first
                                                                                                        glycosyltransferase LgtD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          of the invention.
                                                                                                                                                                                                    Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              93.7%;
94.0%;
                                                                       lipo-oligosaccharide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11;
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Pred. No. 3.8e-172;
1; Mismatches 8;
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                                                                         lgt
                                                                         gene;
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or preventing
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                                                                                                                      RESULT 5
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Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       5 Glycosyltransferases (AAR91311-15) are products of the lgt locus (AAR14061) of Nelserria gonorrhoeae strain F62. Glycosyltransferase LgtD (AAR91314) can be obtd. by expression of the lgtD coding sequence in recombinant host cells. A method for adding GalNAC or GlcNAC betal-3 to Gal comprises contacting a reaction mixture contg. activated GalNAC or GlcNAC to an acceptor moiety comprising a Gal residue in the presence of LgtD. Oligosaccharides can be produce that, when attached to non-toxic lipids, are useful for Neisseria vaccine prepn. Blood group core oligosaccharides, and mimics of lacto-N-neotetraose, gangliosides and saccharide portions of globoglycolipids can also be produced using the enzymes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Nucleic acids encoding glycosyl transferase(s) - used in the diagnosis of infection with Neisseria and for the biosynthesis oligo:saccharide(s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Claim 11; Fig
                                           21-MAR-1997
                                                                                                        AAW06579
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                                                                                                                                                                                                                                                                     QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP
                                                                                                                                                                                                                                                                                                                              DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                        KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI
                                                                                                                                                                                                                                                                                                                                                                                                         IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                                                                                                                                                                                                                PSGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
                                                                                                                                                                                                                                               KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY
                                                                                                                                                                                                                                                                                                              DGGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKI
                                                                                                                                                                                                                                                                                                                                                                          IAMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI
                                                                                                                                                                                                                                                                                                                                                                                                                                        RIISNPRNLGFIASLNIGLDELAKS--GGGEYIARTDADDIASPGWIEKIVGEMEKDRSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 214;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
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57.5%;

Score 1049; Pred. No. 2. Mismatches

.9e-102; DB

Indels Length

2;

Gaps

1;

60

178

238

118

be produced

33;

English

of.

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XEXEXEX
      Lipo-oligosaccharide
                                                                                           SLTDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                     (first entry)
                                                    Protein;
     gene-encoded
                                                     337
      protein.
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AAG90151
ID AAG
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                                                                                                          RESULT
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Best Local Similarity
Matches 213; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A lipooligosaccharide-encoding gene region (AAT49230) of Neisseria gonorrhoeae ATCC 33084 includes coding sequences for 5 proteins (AAW06576-80), one of which (AAW06576) is a polyglycosyltransferase that catalyses the addition of GloNAc and GalNAc disaccharides to a galactose moiety. The function of the other 4 proteins is not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 stated in
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Disclosure; Fig 2E-F; 38pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   single galactose moiety
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Transfer of at least 2 saccharide units using poly:glycosyl:transferase - isolated from N. gonorrhoeae, catalysthe addition of both GlcNac and GalNac di:saccharide(s) units to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-PSDB;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          03-JUN-1996;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Polyglycosyltransferase; N-acetylglucosaminyl transferase; N-acetylgalactosaminyl transferase; lipo-oligosaccharide.
                            26-SEP-2001
                                                       AAG90151;
                                                                                 AAG90151 standard;
                                                                                                                                                299
                                                                                                                                                                         301
                                                                                                                                                                                                   239
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                                                                                                                                                                                                                                                                                                                                                                                                                              MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 1997-052351/05.
                                                                                                                                                                                                                                                                   DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI 240
                                                                                                                                                                                                                                                                                                                       IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
                                                                                                                                                                                                                                                                                                                                                                             KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                            QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP
                                                                                                                                                                                                                                                                                                           IAMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI
                                                                                                                                                                                                                                                                                                                                                              RIISNPRNLGFIASLNIGLDELAKS--GGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 118
                                                                                                                                                                                                                                                                                                                                                                                                                LQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                                                                                                                                                SLTDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                                                                                                                                                                         PSGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
                                                                                                                                                                                                  KEETRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY
                                                                                                                                                                                                                                                       DGGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SL,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the specification.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Johnson
                            (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AA;
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                                                                                 Protein;
                            entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               57.4%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         33084
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          English.
                                                                                 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 1046; DB 18;
Pred. No. 6.1e-102;
4; Mismatches 83;
                                                                                 A
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Best Local S
Matches 80
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07-APR-2000;
03-AUG-2000;
                                                                                                                                                                                                                                                                                                                                                                      The present invention provides a number of nucleotide and protein sequences from the Coryneform bacterium Corynebacterium glutamicum. These are useful for identifying the mutation point of a gene derived from a mutant of coryneform bacterium, measuring expression amount and analysing the expression profile or expression pattern of a gene derived from coryneform bacterium, and identifying a homologue of a gene derived from coryneform bacterium. Coryneform bacteria are useful for producing amino acids, nucleic acids, vitamins, saccharides and organic acids, particularly L-lysine. The present sequence is a protein described in the exemplification of the invention.

Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nakagawa
Tateishi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Coryneform bacterium; amino acid organic acid synthesis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Corynebacterium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Novel polynucleotides derived from Coryneform bacteria, for identimutation point of a gene, measuring expression of a gene, analysing expression profile or pattern of a gene and identifying homologous
                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         20-JUN-2001
                                                                                                                                                                                                                                                                                                                                                              European
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (KYOW ) KYOWA HAKKO KOGYO KK.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            18-DEC-2000; 2000EP-0127688
219
                           231
                                                       161
                                                                                 176
                                                                                                           114
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                                                                                                                                                                                                                                                                                          Local Similarity
                                                                                                                                                                                           60
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                                                                                                                                                                                                                        σ
                                                                                                                                                                                                                      PLISVVIPTIAYDEYCSQSIKSVCEQNYENWQIVLVLDG-----APIKDVPQWVKEHER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2001-376931/40.
                                                                                                            IICVATKTKHINE------
                                                                                                                           IIAMGAWLEVLSEEKDGNRLARHHKHGKIWKK-----PTRHEDIAAFFPFGNPIHNNTMIM 175
                                                                                                                                                                               PLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKD---FQKRDSR 59
KYTWIILKRRMELASFLKRSPVRQIFL
                                                     RKQVVEQIGG--YSLEMTRSQDYELFLRLSKIGAIGYLDESLSSYRIHGGQHSRKTSPFK
                                                                                 RRSVID--GGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHS---
                                                                                                                                                                IKIVEQKIRQGTPTSLNNGIK-----ASDGQLIARLDSDDLAAPSRLSKQEEFLRNHPY 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           17;
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                                                                                                                                                                                                                                                                                                                                                              Patent Office.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                   274 AA;
                          -VRQHEIAQGIQKT-ARNDFL 249
                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2000JP-0159162.
2000JP-0280988.
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Senoh A, Ik
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   99JP-0377484
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             glutamicum
                                                                                                                                                                                                                                                                                         14.0%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            3905;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Ando
da M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           246pp + Sequence Listing; English
                                                                                                                                                                                                                                                                               49;
                                                                                                                                                                                                                                                                            Score 254.5; DB Pred. No. 3e-18; 9; Mismatches 9
                                                                                                            HGKIFGQSADLPT-SQDIRQILLVKNPIIHSSVMY 160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  S, Hayashi M,
Ozaki A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        synthesis; vitamin; saccharide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IJ
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                                                                                                                                                                                                                                                                               91;
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                                                                                                                                                                                                                                                                                                          274;
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                                                                                                                                                                                                                                                                               47;
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RESULT 8
AAY68976
ID AAY6
XX
AC AAY6
XX
DT 30-M
XX
XX
DE Cps1
XX
KW Caps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RESULT 7
AAW89330
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                                                                                                                                                                                                                                                                                                                        CC A method has been developed of expressing a glycosyltransferase in a CC host cell. The method comprises introducing into the host cell a nucleic CC acid encoding the glycosyltransferase and incubating the host cell under CC conditions appropriate for expression of the glycosyltransferase, where CC the host cell substantially lacks a protease that cleaves polypeptides CC between two consecutive positively charged amino acid residues. The CC glycosyltransferase can be used in in vitro production of CC use in the manipulation of cell-cell recognition events, particularly CC adhesion of bacteria and viruses to mammalian cells and leukocyte-CC endothelial cell interaction through selectins in inflammation. The CC method provides more readily recoverable active glycosyltransferases comprised the prior art methods involving mammalian glycosyltransferases. The CC present sequence represents a C-terminal peptide from Neisseria companyitidis lgta from the present invention.
                                                                                                                                                                                                                                                                                        Query Match
                                                                                                                                                                                                                                                               Matches
Capsular gene cluster; serotype 1; polysaccharide biosynthesis;
                          CpslK protein which has glycosyltransferase activity.
                                                            30-MAY-2000
                                                                                           AAY68976;
                                                                                                                        AAY68976 standard;
                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Example 1; Fig 8; 61pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Expressing high levels of glycosyltransferases - comprises use either host cells deficient in proteolytic enzymes or modified glycosyltransferase genes deleted in a proteolytic recognition
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI; 1999-035177/03
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Wakarchuk WW,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     glycosyltransferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Neisseria meningitidis lgtA C-terminal peptide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 26-FEB-1999
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAW89330 standard; peptide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (CANA ) NAT RES COUNCIL CANADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27-MAY-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W09854331-A2
                                                                                                                                                                                                                             286 ARRFLYQCFKRTDTPPSGAWLDFAADGRMRRLFTLRQYFGILYRLIKNR 334
                                                                                                                                                                                                                                                           Local Similarity
nes 45; Conserv
                                                                                                                                                                                                  2
                                                                                                                                                                                               meningitidis; lgtC; lgtB; beta-1,4-galactosyltransferase;
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                                                                                                                                                                                                                                                           Conservative
                                                          (first entry)
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                                                                                                                                                                                                                                                                                                                        AA;
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                                                                                                                        Protein;
                                                                                                                                                                                                                                                                          13.4%;
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                                                                                                                                                                                                                                                                        Score 244; DB 20;
Pred. No. 3.1e-18;
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                                                                                                                                                                                                                                                                                     Length 50;
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RESULT 9
AAY68963
ID AAY6
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AAY68963

standard;

Protein;

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Matches 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                    The proteins AAY68970-76 are encoded by the capsular gene cluster of Streptococcus suis serotype 1. The genes in this cluster are involved in polysaccharide biosynthesis of capsular components and antigens. The proteins have glycosyltransferase activities (CpsIE, CpsIG, CpsII, CpsIJ, CpsIK) and CP polymerase activities (CpsIH). The capsule confers bacterium resistance to complement-mediated opsonophagocytosis. The gene cluster is used as a source of probes and primers for serotype-specific detection of S. suis and is also useful for recombinant production of the proteins. The proteins are then useful for producing antigens that can be used in vaccines, for controlling or eradicating a Streptococcal disease, in humans or animals,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                capsular component; antigen; regulation; chain length determination; complement-mediated opsonophagocytosis; serotype-specific detection; antigen; vaccine; Streptococcal disease; CpslE; CpslF; CpslG; . CpslH; CpslI; CpslK; glycosyltransferase; CP polymerase.
                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                             or eradicating a Stre e.g. against S. suis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      New nucleic acid containing the capsular gene cluster of Streptococcus suis, used for serotype-specific detection and to generate antigens or mutants for vaccination -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptococcus suis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Disclosure; Fig 4; 144pp; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              22-JUL-1998;
22-JUL-1998;
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 213
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                                                                                                                                                                                                                                                                                                      5 VSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILA 64
                                                                                                   LRYDTER-----DWAEDYQF------WYDVSKLGRLAYYPEALVKYRL
                                                                                                                                                                                                     ISIIVPIYNVEKYLSKCIDSIVNQTYKHIEILLVNDGSTDNSEEICLAYAKKDSRIRYF- 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000-195104/17.
                                 HANQVSSKHSVRQHEIAQGIQ-KTARNDFLQSMGFK 255
                                                                                                                                      GYDRV------DASGHFLTAEPLPTNQAVLSGRNVCKKL
                                                                                                                                                                     AWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMR-RSVIDGG
                                                                                                                                                                                                                                      QAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 124
RENSITTS-SMTDHRFHCLLEFQNERMDFYESRGDK 247
                                                                   LEADGHRFVVACNKLYKKELFEDFRFEKGKIHEDEYFTYRLLYELEKVAIVKECLYYYVD
                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                             278 AA;
                                                                                                                                                                                                                                                                                                                                            Conservative
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98EP-0202467.
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                                                                                                                                                                                                                                                                                                                                                          12.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                             in pigs.
                                                                                                                                                                                                                                                                                                                                          60;
                                                                                                                                                                                                                                                                                                                                                          Score 227; DB 21; Pred. No. 2.5e-15;
                                                                                                                                                                                                                                                                                                                                            Mismatches
                                                                                                                                                                                                                                                                                                                                            88;
                                                                                                                                                                                                                                                                                                                                                                          Length 278;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The proteins AAY68950-69 are encoded by the capsular gene cluster of Streptococcus suis serotype 2. The genes in this cluster are involved in polysaccharide biosynthesis of capsular components and antigens. The proteins are involved in regulation (CpsA), chain length determination (CpsB, CpsC), export (CpsC), and biosynthesis (CpsE, CpsF, CpsG, CpsH, CpsJ, CpsK). The capsule confers bacterium resistance to complement-mediated opsonophagocytosis. The gene cluster is used as a source of probes and primers for serotype-specific detection of S. suis and is also useful for recombinant production of the proteins. The proteins are then useful for producing antigens that can be used in vaccines, for controlling or eradicating a Streptococcal disease, in humans or animals, e.g. against S. suis in pigs.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Capsular gene cluster; serotype 2; polysaccharide biosynthesis; capsular component; antigen; regulation; chain length determination; complement-mediated opsonophagocytosis; serotype-specific detection; antigen; vaccine; Streptococcal disease; ORF 2Z; ORF 2Z; ORF 2Z; Cps2A; Cps2B; C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  mutants for
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Disclosure; Fig 3; 144pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Smith HE
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22-JUL-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19-JUL-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New nucleic acid containing the capsular gene cluster of Streptococcus suis, used for serotype-specific detection and to generate antigens or
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             N-PSDB; AAZ60929
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221 HANQV--SSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDL 278
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                                                                                                             AWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMR-RSVIDGG
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                                                    LEADGHRFVVAWNKLYKKELFEDFRFEKGKIHEDEYFTYRLLYELEKVAIVKECLYYYVD
                                                                                                                                                                                                                                                                            KKENGGLSDARNYGISR-AK-----GDYLAFIDSDDFIHSEFIQRLHEAIERENALVAVA 116
                                                                                                                                                                                                                                                                                                                                                                                             ISIIVPIYNVEQYLSKCINSIVNQTYKHIEILLVNDGSTDNSEEICLAYAKKDSRIRYF-
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Pred. No. 3.8
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                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                             Note: This patent is in the same patent family as WO200065062, contains additional sequences as shown in AAB99132-AAB99143, AAH75903-AAH75920 and AAG66436.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                WPI; 2001-126236/14.
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Querellou J,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               New nucleotide sequences isolated from proteins useful in industry -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     21-APR-1999;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Hyperthermophilic archaeon; hyperthermophilic protein
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  119
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SIIAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRS 178
                                                   YIRLKKNSGGPIARNIGIKK-AK-----GRFIALLDDDDEWLPHRLEVQVRKFENLGKEF
                                                                                                          ILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEME----KDR 118
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Pred. No. 4.6e-15;
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                                                                                                                                                                                  probably a glycosyl transferase.

Novel exopolysaccharides can be produced by transforming lactic acid bacteria which produce exopolysaccharides with DNA encoding at least one enzyme from the eps operon. The new exopolysaccharides are useful for thickening drinks, liquid desserts, yoghurts, soups,
                                                                                                                                                                                                                                                  A chromosomal DNA sequence representing practically the whole eps (exopolysaccharide biosynthesis) operon from Streptococcus thermophilus strain Sf16 (deposited as CNCM I-1590) was isolated. The sequence contained 14 open reading frames, one of which was located on the complementary strand. The present sequence is decoded from the epsH open reading frame. The EpsH protein is
                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                      Claim 7;
                                                                                                                                                                                                                                                                                                                                                                            DNA from lactic acid bacteria - encoding exo-polysaccharide biosynthesis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  115 GVVYGGFYYVSQDGRILGKRLPKH--RGDIYSHLLKENFI-----GSP----TLLIRRE 162
              61
                                                                                                           Local
                                        w
                                                                   ٢
                                                     MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LIRKH
            KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SVRQH 234
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CFKKAGLFDPRLSSSQDWDMWLRIARYYKFDYVDEIIAKYYVHGKQISFNMKKYIPGRER 222
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VIDGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVS-----SKH
                                       LKSLISIVIPVYNVEKYLEKCLQSVQNQTYNNFEVILVNDGSTDSSLSICEKFVNQDKRF 62
                                                                                                                                                                                                                                                                                                                                                                                                                        AAT62328
                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                   Pages 33-34; 42pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           227
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             Stingele
                                                                                                                                                324 AA;
                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 95EP-0201669
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: : :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                         11.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SA
                                                                                            67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         324
                                                                                                                                                                                                                                                                                                                                                    French.
                                                                                           Score 217.5; DB 1
Pred. No. 3.2e-14;
7; Mismatches 103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             operon; lactic acid bacterium;
                                                                                                                                                                                                                                                                                                                                                                                           enzymes
                                                                                                                    DB 18;
                                                                                           103;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                epsH; epsI;
                                                                                                                                                                                                                                                                                                                                                                                           involved
                                                                                           Indels
::
                                                                                                                    Length
                                                                                                                    324;
                                                                                                                                                                                                                                                                                                                                                                                           in
                                                                                           89;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                epsű;
                                                                                         Gaps
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                                                                                           15;
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В Qy

ω \vdash

MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60

LKSLISIVIPVYNVEKYLEKCLQSVQNQTYNNFEVILVNDGSTDSSLSICEKFVNQDKRF

62

Local Similarity les 80; Conserv

Conservative

67;

Mismatches

103;

Indels

, 68

Gaps

15;

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RESULT 12
AAW22177
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      B
Query Match
Best Local S
Matches 80
                                                                                     encoded by the Rfbv ORF of the rfb cluster from Salmonella typhimurium and is probably a glycosyl transferase. The EPS are useful for thickening e.g. drinks, liquid desserts, yoghurts, soups, ice-creams.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Streptococcus thermophilus; operon; exopolysaccharide; synthesis; open reading frame; thickening; drink; liquid dessert; yoghurt; sauce; ice-cream; coffee cream; mayonnaise; glycosyl transferase.
                                                     Sequence
                                                                                                                                    The operon has 13 open reading frames (ORF) designated epsA-M encoding proteins AAW22169-81. This protein has 24% identity to a protein
                                                                                                                                                                This sequence represents the protein encoded by the epsI gene from the Streptococcus thermophilus exopolysaccharide (EPS) synthesis operon.
                                                                                                                                                                                                         Claim 7;
                                                                                                                                                                                                                                   DNA of lactic acid bacteria - encoding exo-polysaccharide biosynthesis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      S.thermophilus exopolysaccharide synthesis
                                                                                coffee creams,
                                                                                                                                                                                                                                                                               N-PSDB; AAT73236.
                                                                                                                                                                                                                                                                                          WPI; 1997-044837/05
                                                                                                                                                                                                                                                                                                                                                                                                                                                             EP750043-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AAW22177
                                                                                                                                                                                                                                                                                                                    Mollet B,
                                                                                                                                                                                                                                                                                                                                                                            20-JUN-1995;
                                                                                                                                                                                                                                                                                                                                                                                                        28-DEC-1995;
                                                                                                                                                                                                                                                                                                                                                                                                                                   27-DEC-1996
                                                                                                                                                                                                                                                                                                                                                (NEST ) SOC PROD NESTLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         269
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDAYDYAYVQRPNSIMNSSFNLKKLDIIEMVHE-MENDIL-----AQFPNLALYVKNRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FAAEVKIFLEIPK----EKEFEQAQKQLWHDIKKNRKAP 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VCSKFFLVDEKGSLLTKKEAPKKKSEVVSIEESIKILLLQQNGYDLA---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SVFSK-ENGGMSSARNFGIKK-AK-----GSFITFVDSDDYIVKDYLSHLVAGIKSETSI 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AA----YELPEKDLPEEDFERARRFLYQCFKRTDTPP 301
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PEAL-VKYRLHANQV-SSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLE-YRQTKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PVSFFETISF------PEGKLYEDMGTTYKLLKLASEVVF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGGLRYDTERDWAEDYQFWYDVSKLGRLAYY
                                                                                                                                                                                                         Page 14-28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          standard; Protein; 324
                                                                                                                                                                                                                                                                                                                    Stingele
                                                      324 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         thermophilus.
                                                                                sauces,
                                                                                                                                                                                                                                                                                                                                                                            95EP-0201669
                                                                                                                                                                                                                                                                                                                                                                                                        95EP-0203663
                                                                                                                                                                                                                                                                                                                       'ŦJ
            11.9%;
                                                                                                                                                                                                        46pp; French.
                                                                                mayonnaise.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ----EVLSEE-----KDGNRLARHHKHGKIWKK-- 151
           Score 217.5; DB 18; Pred. No. 3.2e-14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                                                                                                                                                                                                                  enzymes involved
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      operon epsI gene product.
                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---VWGKLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               soup;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     255
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RESULT 13
AAY54072
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QΥ
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                                                                                                                                                                                                                                                                                                                                                                                      22-APR-1998;
22-APR-1998;
22-APR-1998;
of forming a bond (alpha or beta-isomer) between C-1 (carrying the reducing aldehyde function, of an activated D-galactose pyranose), and a phosphate on a lipophilic or proteinaceous primer. Stepwise synthesis of EPS occurs with, in each step, addition of a new sugar unit, through its hemi-acetyl function, to an alcoholic hydroxyl of a second sugar
                                                                                exopolysaccharides (EPS). These enzymes are designated EPS1-EPS10. and are encoded by open reading frames eps1-eps10. The enzymes are isolated from Streptococcus thermophilus strain Sil39. The proteins are used in a method for the synthesis of EPS, which includes at least one step
                                                                                                                                                                                Claim 3;
                                                                                                                                                                                                          New recombinant enzymes for synthesis particularly in lactic acid bacteria, fermented milk products
                                                                                                                                                                                                                                                                                                                           Stingele F,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   09-DEC-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO9962316-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Exopolysaccharide; EPS; ESP enzyme; EPS1; EPS2; EPS3; EPS4; EPS5; EPS6; EPS7; EPS9; EPS9; EPS10; Streptococcus thermophilus strain Sfi3 activated D-galactose pyranose; saccharide; beta-qlycosyltransferase; transporter; food; fermented milk product; yoghurt; cheese;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY54072;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAY54072 standard; Protein;
                                                                                                                                               AAY54065-74 represent enzymes involved in the biosynthesis of
                                                                                                                                                                                                                                                                                                                                                         (NEST ) SOC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         27-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                    22-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             flavour stability; organoleptic property.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                256 FAAEVKIFLEIPK----EKEFEQAQKQLWHDIKKNRKAP 290
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              212
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           152
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                                                                                                                                                                                                                                                                            2000-097267/08.
DB; AAZ45258, AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AA----YELPEKDLPEEDFERARRFLYQCFKRTDTPP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PEAL-VKYRLHANOV-SSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLE-YRQTKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VCSKFFLVDEKGSLLTKKEAPKKKSEVVSIEESIKILLLQQNGYDLA-----VWGKLY 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SVFSK-ENGGMSSARNFGIKK-AK-----GSFITFVDSDDYIVKDYLSHLVAGIKSETSI 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LDAYDYAYVQRPNSIMNSSFNLKKLDIIEMVHE-MENDIL-----AQFPNLALYVKNRA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PVSFFETISF - - - -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGGLRYDTERDWAEDYQFWYDVSKLGRLAYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IAMGAWL------EVLSEE-----KDGNRLARHHKHGKIWKK--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EPS8 which is involved in exopolysaccharide biosynthesis
                                                                                                                                                                              Page 105-106; 162pp; French.
                                                                                                                                                                                                                                                                                                                                                          PROD NESTLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
                                                                                                                                                                                                                                                                                                                         Germond
                                                                                                                                                                                                                                                                                                                                                                                      98EP-0201310.
98EP-0201311.
98EP-0201312.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              thermophilus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    99WO-EP02841
                                                                                                                                                                                                                                                                          AAY54072,
                                                                                                                                                                                                                                                                                                                         JE,
                                                                                                                                                                                                                                                                                                                                                          SA.
                                                                                                                                                                                                                                                                                                                         Lamothe
                                                                                                                                                                                                                                                                          AAY54073,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      316 AA
                                                                                                                                                                                                                                                                                                                         Ġ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -----PEGKLYEDMGTTYKLLKLASEVVF
                                                                                                                                                                                                                              for
                                                                                                                                                                                                                                              of exopolysaccharides,
                                                                                                                                                                                                                                                                            AAY54074.
                                                                                                                                                                                                                            improving properties
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                301
                                                                                                                                                                                                                              of.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sfi39;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      151
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Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                                                                                                                                                    22-APR-1998;
22-APR-1998;
22-APR-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          unit, present at the end of a chain of sugar residues bonded to the primer. EPS1 to EPS4 are used to elongate the EPS Chain, and to regulate EPS production, EPS5 creates new bonds between saccharides, EPS6 is used in the biosynthesis of EPS, EPS7 and EPS8 are beta-glycosyltransferases, EPS9 is a transporter of repetitive units, and EPS10 catalyses the conversion of a pyranose form of a beta-D-galactose to the furanose form. The EPS enzyme are used to improve properties of foods, particularly fermented milk products such as yoghurt and cheese,
                                                                                                                                                                                                                                                                                                                                                                       eps3; eps4; eps5; eps6; eps7; eps8; eps9; eps10; exopolysaccharide biosynthesis; EPS; intersugar bond; antitumour; probiotic; foodstuff; organoleptic quality; flavour; lactic acid bacteria; acidified milk product; yoghurt; cheese.
                                              Claim 3; Page 106-107; 163pp; French.
                                                                                                                            N-PSDB;
                                                                                                                                        WPI; 2000-013255/01.
                                                                                                                                                                                                                                                                                                                        W09954475-A2
                                                                                                                                                                                                                                                                                                                                               Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                              eps operon; Streptococcus thermophilus Sfi39; enzyme; eps3; eps4; eps5; eps6; eps7; eps8; eps9; eps10:
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               11-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAY43774;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAY43774 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                e.g. their organoleptic properties and flavour stability.
                                                                                                 New recombinant enzymes
                                                                                                                                                                                          (NEST ) SOC
                                                                                                                                                                                                                                                                       22-APR-1999;
                                                                                                                                                                                                                                                                                                28-OCT-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               114 IVRGSF 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121
                                                                                    .g. antitumor or probiotic
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KVINQ-KNQGLSVARNTGID-----AATGKYIAFVDADDKIKPDFVSSLYQIADKTGAD 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                           AAZ30355,
                                                                                                                                                                   Ή,
                                                                                                                                                                                                                                                                                                                                                                                                                                                     sequence of eps8 of Streptococcus thermophilus Sfi39
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         316 AA;
                                                                                                                                                                                           PROD NESTLE
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                                                                                                                                                                                                                                                                                                                                                thermophilus.
                                                                                                                                                                                                                                98EP-0201310.
98EP-0201311.
                                                                                                                                                                                                                     98EP-0201312
                                                                                                                                                                                                                                                                     99WO-EP03011
                                                                                                                           AAY43774, AAY43775, AAY43776;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   11.8%;
35.7%;
                                                                                                                                                                   JE,
                                                                                                    for
                                                                                                                                                                                             SA
                                                                                                                                                                   Lamothe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       29;
                                                                                     properties
                                                                                                 biosynthesis of exopolysaccharides having
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 214.5; I
Pred. No. 6.5e
29; Mismatches
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                                                                                       or useful in fermented milk
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AAY43767-76 represent the proteins encoded by the eps operon of Streptococcus thermophilus Sfi39. The operon contains 10 open r frames, and encodes enzymes (eps1, eps2, eps3, eps4, eps5, eps6

reading

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RESULT 15
AAB47426
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The sequences given in AAB47426-27 are encoded by a fragment of the plasmid derived from L. lactis subspecies cremoris Ropy352. The EPS plasmid is about 32 kb in size and encodes at least 13 active genes.
                                                           Claim 28; Page 67-68; 73pp; English.
                                                                                          beauty cosmetics, comprises characteristics cremoris Ropy 352
                                                                                                       New bacterium useful in pharmaceutical formulations, food products and beauty cosmetics, comprises characteristics of Lactococcus lactis
                                                                                                                                                       N-PSDB;
                                                                                                                                                                                              Trempy JE,
                                                                                                                                                                                                                                                                         02-FEB-2000;
16-OCT-2000;
                                                                                                                                                                                                                                                                                                                     02-FEB-2001; 2001WO-US03404.
                                                                                                                                                                                                                                                                                                                                                    09-AUG-2001.
                                                                                                                                                                                                                                                                                                                                                                                WO200157234-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                        EPS plasmid; Lactococcus lactis subspecies cremoris Ropy352; exopolysaccharide; EPS352; milk; thickener; glycosyltransferase; biosynthesis; fruit juice.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EpsN.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAB47426;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         AAB47426 standard; Protein; 332 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                              Lactococcus lactis
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les 45; Conserv
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US DEPT OF AGRICULTURE.
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                                                                                                                                                                                              Sandine WE,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             products, beauty care products and coating agents.
                                                                                164
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215 DSASK
                                        224 QVSSK
                                                                                                                                                                                                   124 GAW------LE---VLSEEKD-GNRLARHHKHGKIWKKPTRHEDIAAFFP 163
                                                                                                                                                                                                                                             64 YNTKNLGVSHARNYGIDR-----ASGSYIMFLDPDDTYDKSYCLEMIGLINKFNADVVM 117
                                                                                                                                                                                                                                                                                   64 AQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAM 123
                                                                                                                                                                                                                                                                                                                              G
                                                                                                                                                                                                                                                                                                                                                                  4 LVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKIL 63
                                                                            ----TRIFRKNVIN-NVKFNESINYLEDMLFNISIVHNARIIAYTNKRHYFYLQRE 214
                                                                                                                      FGNPIHNNTMIMRRSVIDGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHAN 223
                                                                                                                                                               SNYYICKGKNIYPNVNNDLLECEGLLSRDKTMRSILSDTGFKGFVW-----
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                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                        228
219
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           332 AA;
                                                                                                                                                                                                                                                                                                                                                                                                            Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                             11.6%;
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Pred. No. 1.
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Search completed: December 2, 2002, 11:58:59
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Result
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US-08-683-426-3
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US-08-683-428-11
US-08-683-428-11
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US-08-478-140B-8
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61 KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120

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Query Match 100.0%; Best Local Similarity 100.0%; Matches 348; Conservative 0

; Score 1823; DB 1; ; Pred. No. 5.5e-190; 0; Mismatches 0;

Indels Length

Gaps

0

348; 0;

US-08-312-387B-3 Sequence 3, Application US/08312387B Patent No. 5445553 GENERAL INFORMATION: APPLICANY: GOLSCHLICH, Emil C. TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM NUMBER OF SEQUENCES: L. CORRESPONDENCE ADDRESS: ADDRESSEE: Klauber & Jackson STREET: 411 Hackensack Avenue CITY: Hackensack Avenue CITY: Hackensack Avenue CITY: Hackensack Avenue COMPUTER: LIBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTMARE: Patentin Release #1.0, Version #1.25 COMPUTER READABLE FORM: APPLICATION UNMBER: US/08/312,387B FILING DATE: July 7, 1994 CLASSIFICATION: 435 ATTORNEY/AGENT INFORMATION: REGISTRATION: 435 ATTORNEY/AGENT INFORMATION: TELEPHONE: 201 487-5800 TELEPAX: 201 487-580 TELEPAX: 201 347-1884 TELEPAX: 31521 INFORMATION FOR SEQ ID NO: 3: SEQUENCE CHRARCTERISTICS: LENGTH: 348 amino acids TYPE: mino acid TOPOLOGY: Linear US-08-312-387B-3	ALIGNMENTS	28 217.5 11.9 324 1 US-08-746-682A-10 Sequence 10, Appl 29 210 11.5 965 4 US-09-437-277-3 Sequence 3, Appli 30 200 11.0 702 4 US-09-437-277-1 Sequence 1, Appli 31 191.5 10.5 674 4 US-08-961-083-198 Sequence 198, Appli 32 175 9.6 281 4 US-08-961-083-198 Sequence 198, Appli 34 154.5 8.5 93 4 US-08-961-083-198 Sequence 198, Appli 35 147.5 8.1 79 4 US-08-961-083-202 Sequence 521, Appli 36 130 7.1 358 4 US-09-134-001C-563 Sequence 5633, Appli 37 129 7.1 303 4 US-09-134-001C-563 Sequence 202, Appli 39 113.5 6.2 517 3 US-08-967-506-19 Sequence 19, Appli 40 113.5 6.2 517 3 US-08-967-506-19 Sequence 19, Appli 41 113.5 6.2 559 3 US-08-967-506-9 Sequence 9, Appli 41 113.5 6.2 559 3 US-08-967-506-9 Sequence 9, Appli 41 113.5 6.2 559 3 US-08-967-506-9 Sequence 9, Appli 113.5 6.2 559 5 PCT-US94-02552-9 Sequence 9, Appli 5 Sequence 9, Appli 5 Sequence 9, Appli 5 Sequence 9, Appli 5 Sequence 9, Appli 113.5 6.2 559 5 PCT-US94-02552-9 Sequence 9, Appli 5 Sequence 9, App
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INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
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                                                                                                                                                                                                                                                                 NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: F10ppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/683,426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM NUMBER OF SEQUENCES: 12
                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: 536
PRIOR APPLICATION DATA:
APPLICATION UMBER: 08/312,
PILING DATE: September 26,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
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                                                                Score 1823; DB 1;
Pred. No. 5.5e-190;
; Mismatches 0;
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Sequence 3, App....
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TELEX: 133521
INFORMATION FOR SEQ ID NO:
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                                                                                                                                                                                                                                                                             NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/683,458
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PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 1994
CLASSIFICATION: 435
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                                                                                                                                                MOLECULE TYPE: protein
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ADDRESSEE: Klauber & Jackson
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201 343-1684
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Local Similarity 100.0%;
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IVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
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                                                                Score 1823; DB 1;
Pred. No. 5.5e-190;
); Mismatches 0;
                                                                                                  Length
                                                                  Indels
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US-08-878-360-3
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Best Local Similarity
Matches 348; Conserv
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APPLICANT: Gotsch
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TELEX: 133521
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                               NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                         TOPOLOGY: 1: MOLECULE TYPE:
                                                                                                                       SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version
CURRENT APPLICATION DATA:
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MEDIUM TYPE: Floppy
COMPUTER: IBM PC com
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CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
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APPLICATION NUMBER:
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                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: FILING DATE: Septem CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICATION NUMBER: US/08/878,360 FILING DATE: 18-JUN-1997 CLASSIFICATION: 435
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     Conservative
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SYSTEM: PC-DOS/MS-DOS
                                                                                                            linear
                                                                                       protein
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                100.0%;
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                Score 1823; DB 2;
Pred. No. 5.5e-190;
   Mismatches
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                                   Length 348;
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SEQUENCE DESCRIPTION: $00-09-333-412-3
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US-09-333-412-3
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                                                                                                                                                                                   NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPAX: 201 343-1684
TELEFAX: 133521
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
Query Match
Best Local Similarity
Matches 348; Conserv
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                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/09/33,412
FILING DATE: 15-Jun-1999
CLASSIFICATION: CUNKnown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
OLIGOSACCHARIDES, AND GENES ENCODING 1
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                                                                                                                                                     TYPE: amino acids
                                                                                                             TOPOLOGY: linear
ULE TYPE: protei
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STREET: 411 Hackensack Avenue
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Score 1823; DB 4;
Pred. No. 5.5e-190;
Mismatches 0;
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US-08-312-387B-11
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                                               Matches
                                                                          Query Match
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                                                                                                                                                                                               INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                       NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                                                                                              SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF TITLE OF INVENTION: OLICOSACCHARIDES, AND GENES ENCODING THEM NUMBER OF SEQUENCES: 12

CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: US/08, FILING DATE: July 7, 1994 CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
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                                                                                                                       MOLECULE TYPE:
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                                             Local Similarity nes 347; Conserv
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STATE: New Jerse
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                                                                                                                                   TOPOLOGY:
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1 MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
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)GY: linear
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411 Hackensack Avenue
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                                               Conservative
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99.7%;
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                                          Score 1820; DB 1;
Pred. No. 1.2e-189;
1; Mismatches 0;
                                                                       Length 348;
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Query Match
Best Local Similarity
Matches 347; Conserv
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GENERAL INFORMATION:
                                                                                                                                                                                          TELEX: 133521
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                           NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                    SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: Patentin Release #1.0, Version CURRENT APPLICATION DATA:
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                                                                                               MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/
FILING DATE: September
CLASSIFICATION: 536
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                                                                                                                                                                                                                                                                                                                                     ATTORNEY/AGENT INFORMATION:
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121 IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: US/08/683,426 FILING DATE: CLASSIFICATION: 536
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                                                                                                                  TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                              TELEFAX:
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                        99.8%;
99.7%;
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ber 26, 1994
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     Score 1820; DB 1;
Pred. No. 1.2e-189;
Pred. No. 1.2e-189;
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                                       Length 348;
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Query Match
Best Local Similarity
Matches 347; Conserv
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GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 11,
                                                                                                                                                                            INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                        NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095A
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 1994
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
NUMBER OF SEQUENCES: 12
                                                                                                                                                       SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                        FILING DATE:
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
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COUNTRY:
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CITY: Hackensack
STATE: New Jersey
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                                                                                                          TOPOLOGY:
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                                                                                                                                       LENGTH:
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                                                                                                                          4: 348 amino acids
amino acid
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        Conservative
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                        99.8%;
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                      Score 1820;
Pred. No. 1.
        Mismatches
      ..2e-189;
nes 0;
                                        DB 1;
                                    Length 348;
        Indels
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SOPTMARE: PATENTIA Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION UMBER: US/08/878,360
FILING DATE: 18-JUN-1997
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION UMBER: 08/683,426
FILING DATE: 89/683,426
FILING DATE: September 26, 1994
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence 11, Application US/08878360 Patent No. 5945322 GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
                                                            TELEX: 133521
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
TYPE: amino a TOPOLOGY: li
                                                                                                                                     TELECOMMUNICATION INFORMATION: TELEPHONE: 201 487-5800
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MEDIUM TYPE: Floppy disk
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CITY: Ha
STATE: N
COUNTRY:
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                                                    LENGTH:
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                                 amino acid
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                                                     348 amino acids
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Query Match

99.8%;

Score 1820;

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                                                                                                                                                                                                                                                                                                                       ADDRESSEE: Pennie & Edmonds
STREET: 1155 Avenue of the America
CITY: New York
STATE: New York
COUNTRY: USA
ZIP: 10036-2711
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC Compatible
COMPUTER: IBM PC COMPATING SYSTEM:
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, V
CURRENT APPLICATION DATA:
                                                                                                                                                                        APPLICATION NUMBER: US/08/478
FILING DATE: 07-UN-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: LAUTA A. COTUZZI
REGISTRATION NUMBER: 30,742
REFERENCE/DOCKET NUMBER: 7188
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
                                                                                                         TELEX: 66141 PENNIE (NFORMATION FOR SEQ ID NO: 3:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: ROTH, STEPHEN
APPLICANT: BUCZALA, STEPHANIE L.
APPLICANT: BUCZALA, STEPHANIE L.
TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
                                                                  SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acid
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-478-140B-3
                   MOLECULE TYPE:
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                                                 TYPE: amino acid
                                                                                                                                           TELEFAX: (212) 790-9090
TELEFAX: (212) 869-9741/8864
                                    TOPOLOGY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 LQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
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                                                                348 amino acids
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ROTH, STEPHEN
                                    linear
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1; Mismatches 0;
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RESULT 11
US-08-478-140B-8
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Patent No. 6127153
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                                                                                                     TELEX: 66141 PENNIE INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT:
                                                                                                                                                                                                                                                                                                                    ZIP: 10036-2711

COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: BUCZALA, STEPHANIE L.

TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSF
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
                                                                                                                                                                                            APPLICATION NUMBER: US/08/478,140B
FILING DATE: 07-UU-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Laura A. COTUZZI
REGISTRATION UMBER: 30,742
REFERENCE/DOCKET NUMBER: 7188-017
                                                                                                                                                            TELECOMMUNICATION INFORMATION: TELEPHONE: (212) 790-9090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                    STREET: 1155 AVE.
CITY: New York
STATE: New York
COUNTRY: USA
ZIP: 10036-2711
                                                                                    SEQUENCE CHARACTERISTICS:
MOLECULE TYPE:
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                                TYPE: amino a STRANDEDNESS:
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                  TOPOLOGY:
                                                                     LENGTH:
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                                                amino acid
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                                                                 348 amino acids
                                                                                                                                             (212) 869-9741/8864
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Gaps

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RESULT 12
US-09-33-412-11
US-09-33-412-11
Sequence 11, Application US/0933
Patent No. 6342382
GENERAL INFORMATION:
APPLICANT: Gotschlich, Br
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                                                   INFORMATION FOR SEQ ID NO: 11: SEQUENCE CHARACTERISTICS:
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                                                                                 NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPHAN: 201 343-1684
TELEX: 133521
TELEX: 133521
                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                          SOFTWARE: PatentIn Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                     APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                       PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
OLIGOSACCHARIDES, AND GENES ENCODING
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180
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                                                                                                                                                                                                                                                                        CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                        APPLICATION NUMBER: US/09/333,412 FILING DATE: 15-Jun-1999
                                                                                                                                                                                                                                                                                                                                                           COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CITY: Hackensack
                                                                                                                                                                                                                                                                                                                                                                                                                                                  COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET: 411 Hackensack Avenue
                 LENGTH: 348 amino acids TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE: Klauber & Jackson
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99.7%;

    Mismatches

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Pred. No. 1.2e-189;
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US-09-338-943-3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patent No.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: JOHNSON, KARL F.
APPLICANT: ROTH, STEPHEN
APPLICANT: BUCZALA,
STEPHANIE L.
APPLICANT: BUCZALA,
STEPHANIE L.
TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
POLYGLYCOSYLTRANSFERASE
                                                            FILING DATE:
ATTORNATION:
NAME: Laura A. Coruzzi
REGISTRATION NUMBER: 30,7
REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                  COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/338,943
                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compati
                              TELEPHONE: (212) 790-9090
                                                                                                                                                  PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS
                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES:
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                                                                                                                                                                                    FILING DATE:
CLASSIFICATION:
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               TELEFAX:
                                                                                                                                                                                                                                                                                                                                          ZIP: 10036-2711
                                                                                                                                                                                                                                                                                                                                                           COUNTRY:
                                                                                                                                                                                                                                                                                                                                                                             STATE:
                                                                                                                                                                                                                                                                                                                                                                                         CITY: New York
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3, Application US/09338943
o. 6379933
                                                                                                                                                                                                                                                                                                                                                                           New York
: (212) 869-9741/8864
66141 PENNIE
                                                                                                                                                                                                                                                                                                                                                                                                             1155 Avenue
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                                                                                 30,742
                                                                 7188-017
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Pred. No. 1.2e-189;
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Hest Local Similarity 99.7%;
Matches 347; Conservation
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
APPLICANT:
                                                                                                                                                 CURRENT APPLICATION DATA: APPLICATION NUMBER: US
                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
ADDRESSEE: Pennie & Edmonds
STREET: 1155 Avenue of the Americas
                                               ATTORNEY/AGENT INFORMATION:
                                                                                PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                         NUMBER OF SEQUENCES:
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CITY: N
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               NAME: Laura A. Coruzzi
REGISTRATION NUMBER: 3
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TOPOLOGY:
REFERENCE/DOCKET
                                                                                                                                                                                      SOFTWARE: PatentIn Release #1.0, Version #1.30
                                                                    FILING DATE:
                                                                                                                   CLASSIFICATION:
                                                                                                                                     FILING DATE:
                                                                                                                                                                                                                                                                                          COUNTRY:
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   amino acid

OGY: linear
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                                                                                                                                                                                                                                                                                                        New York
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VYENTION: METHOD OF TRANSFERRING AT LEAST TWO

NVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,

VVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A

VENTION: POLYGLYCOSYLTRANSFERASE
                                                                                                                                                                                                                                                                                        USA
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 NUMBER:
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               30,742
                                                                                08/478,140
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Pred. No. 1.2e-189;
1. Mismatches 0;
 7188-017
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US-08-312-387B-5
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Matches
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Best Local Similarity
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GENERAL INFORMATION:
GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: GOTSCHICH, Emil C.
APPLICANT: GOTSCHICH, Emil C.
APPLICANT: GOTSCHICH, Emil C.
APPLICANT: GOTSCHICH, Emil C.
APPLICANT: GENERAL C.
APPLICANT STORES ENCODING THEM
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
TITLE OF INVENTION: 0LIGOSACCHARIDES, AND GENES ENCODING THEM
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TELEX: 66141 PENNIE
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                        COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
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                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
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                                                             ATTORNEY/AGENT INFORMATION:
TELECOMMUNICATION INFORMATION
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            NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742 REFERENCE/DOCKET NUMBER: 600
                                                                              FILING DATE: July 7, 1994 CLASSIFICATION: 435
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                                                                                                              APPLICATION NUMBER:
                                                                                                                                                                                                                                   ZIP: 07601
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                                                                                                                                                                                                                                                                                     CITY: Hackensack
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                                                                                                                                                                                                                                                                    New Jersey
                                                                                                                                                                                                                                                                                                       411 Hackensack Avenue
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(212) 869-9741/8864
                                                                                                                                                                                                                                                      USA
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Pred. No. 1
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; TELEPHONE: 201 487-5800
; TELERAX: 201 343-1684
; TELEX: 133521
; INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
; TYPE: amino acid
; TOPOLOGY: linear
; MOLECULE TYPE: protein
US-08-312-387B-5
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Search completed: December Job time: 13.9535 secs
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                                                                                                          299
                                              301 PSGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
                                                                       SLTDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
        2, 2002, 12:03:13
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Minimum DB
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Listing first 45 summaries
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      9
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12 US-10-007-267-1

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12 US-10-007-267-1

13 US-09-97-041-3

14 US-09-767-041-3

15 US-09-767-041-3

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17 US-09-767-041-3

18 US-09-767-041-3

19 US-09-767-041-3

19 US-09-767-041-3
                       US-09-816-028A-27

US-09-767-041-35

US-09-816-028A-29

US-09-765-272-200

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794.504 Million cell updates/sec
Sequence 3, Appli
Sequence 11, Appl
Sequence 12, Appli
Sequence 22, Appli
Sequence 23, Appli
Sequence 36, Appli
Sequence 37, Appli
Sequence 27, Appli
Sequence 27, Appli
Sequence 29, Appli
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Sequence 31, Appli
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Sequence 32, Appli
Sequence 33, Appli
Sequence 34, Appli
Sequence 52, Appli
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US-10-007-267-3
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97.5	98.5	100.5	102	104	110.5	111.5	113.5	113.5	113.5	113.5	116.5	123	123	129	142.5	147.5	151	151	151	158	164	164	168.5	169	175
5.3		5.5		•		6.1		6.2		•	6.4	6.7	6.7	7.1	7.8		8.3	8.3	8.3	8.7	9.0		9.2		9.6
326	256	803	626	418	559	612	561	559	559	559	559	573	358	303	269	79	187	187	187	210	715	706	120	297	281
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K A	883	8,	27,	33,	24,	Sequence 25, Appl	1006	23,	21,	20,	Sequence 22, Appl	12474,	5714,	202,	41, 7	168	4	Sequence 7, Appli	4, Ap	Sequence 47, Appl	10511,	4950	51,	Sequence 31, Appl	Sequence 196, App

ALIGNMENTS

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Sequence 3, Application US/10007267
Patent No. US20020127682A1
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
             TELEX: 133521
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acids
                                                                                                                                                                                       APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNEY/ACENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                       TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICATION NUMBER: US/10/007,267
FILING DATE: 03-Dec-2001
CLASSIFICATION: <Unknown>
                                                                                                                   TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
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TYPE: amino acid
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RESULT 2
US-10-007-267-11
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TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO: 11:
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                                                                                                                                         PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Unn-1999
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNETY/AGENT INFORMATION:
                                                     REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                                             COMPUTER: IBM PC compatible operating system: PC-DOS/MS-DOS SOFTMARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
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MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: GOTSCHlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSPERASES FOR BIOSYNTHESIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP 300
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                                                                                                                                                                                                                                                       APPLICATION NUMBER: US/10/007,267 FILING DATE: 03-Dec-2001 CLASSIFICATION: <Unknown>
                                                                                                        NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742
                                                                                                                                                                                                                                                                                                                                                                                                                                                        STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CITY: Hackensack
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Pred. No. 1.9e-163;
; Mismatches 0;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence 5, Application US/10007267
Patent No. US20020127682A1
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match 99.8
Best Local Similarity 99.7
Matches 347; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              301
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esg., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61
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FILING DATE: 03-Dec-2001
CLASSIFICATION: -Unknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                          COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF OLIGOSACCHARIDES, AND GENES ENCODING THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PSGAWLDFAADGRMRRLFTLRQYFGILYRLIKNRRQARSDSAGKEQEI 348
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                                                                                                                                                                                                                                                                                                                                                                                              COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                    STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                      CITY: Hackensack
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LENGTH: 348 amino acids
TYPE: amino acid
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99.7%;
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TELEFAX: 201 343-16
TELEX: 133521
INFORMATION FOR SEQ ID NO: 5:

201 343-1684

SEQUENCE CHARACTERISTICS:

LENGTH: 337 amino acids

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TYPE: amino acids

TOPOLOGY: linear

MOLECULE TYPE: protein

SEQUENCE DESCRIPTION: SEQ ID NO:
US-10-007-267-5
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Best Local Similarity 64.5%;
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                                                                                                  CURRENT APPLICATION UNBER: US/10/007,267
APPLICATION NUMBER: US/10/007,267
APPLICATION DATE: 03-Dec-2001
CLASSIFICATION: <Unknown>
PRIOR APPLICATION DATA:
APPLICATION UNBER: US/09/333,412
FILING DATE: 15-Jun-1999
FILING DATE: 15-Jun-1999
                     ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., Dav
                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      IAMGAWLEVLSEEKDGNRLARHKHGKIWKKPTRHEDIAAFFPEGNPIHNNTMIMRRSVI 180
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY 298
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                                                             APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994
                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                 COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                   STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                         CITY: Hackensack
                                                                                                                                                                                                                                                                                                                                                                                                                                          ADDRESSEE: Klauber & Jackson
STREET: 411 Hackensack Avenue
                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Release #1.0, Version #1.25
                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                              ZIP: 07601
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Jackson Esq., David A. TRATION NUMBER: 26,742
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                OLIGOSACCHARIDES, AND GENES ENCODING THEM
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Pred. No. 7.1e-91;
33; Mismatches 83;
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Matches

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29;

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                                                             ; OTHER INFORMATION: US-09-924-358-29
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                                                                                                                                                             NUMBER OF SEQ ID NOS: 52
SOFTWARE: FastSEQ for Windows Version 4.0
SEQ ID NO 29
LENGTH: 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 29, Application US/09924358 Patent No. US20020107376A1
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                                                                                                                                                                                                                                        APPLICANT: Milennium Pharmaceuticals, Inc.
APPLICANT: Meyers, Rachel
APPLICANT: Meyers, Rachel
APPLICANT: Meyers, Rachel
APPLICANT: Meyers, Rachel
TITLE OF INVENTION: 26199, 33530, 33949, 47148, 50226, AND
TITLE OF INVENTION: 58764,
TITLE OF INVENTION: NOVEL HUMAN TRANSFERASE FAMILY MEMBERS
FILE REFERENCE: 38155-20034.00
CURRENT APPLICATION NUMBER: US/09/924,358
CURRENT FILING DATE: 2001-08-06
PRIOR APPLICATION NUMBER: US 60/229,300
PRIOR FILING DATE: 2000-09-01
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                                                                                                  TYPE: PRT
ORGANISM: Artificial Sequence
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INFORMATION FOR SEQ ID NO: 12:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TOPOLOGY: linear MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ
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LENGTH: 337 amino acids
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PSGAWLDFAADGRMRRLFTLROYFGILYRLIK 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     DGGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKI 238
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY 298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IAMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
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                                                                              Consensus amino acid
12.6%;
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64.28;
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Score 230; DB 10;
Pred. No. 1.5e-14;
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                   Length 150;
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; NAME/KEY: misc_feature
; OTHER INFORMATION: CPS2K
US-09-767-041-22
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US-09-767-041-22
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SEQ ID NO 22
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CURRENT APPLICATION NUMBER: US/09/767,041
CURRENT FILING DATE: 2001-01-22
PRIOR APPLICATION NUMBER: PCT/NL99/00460
PRIOR FILING DATE: 1999-07-19
PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR FILING DATE: 1998-07-22
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PRIOR APPLICATION NUMBER: EP98202467.1
PRIOR FILING DATE: 1998-07-22
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TYPE: PRT
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285 QLKQNKRLA 293
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                                    330 LIK-NRRQA 337
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                                                                                                                                                                                                                                                                                                                  117 GYDRV-----
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                                                                                                                                                                                             ANQV--SSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLEYRQTKAAAXELPEKDLP 279
                                                                                                                                                                                                                                  LEADGHRFVVAWNKLYKKELFDFRFEKGKIHEDEYFTYRLLYELEKVAIVKECLYYYVDR
                                                                                                                                                                                                                                                                                                                                                                                            KKENGGLSDARNYGISR-AK-----GDYLAFIDSDDFIHSEFIQRLHEAIERENALVAVA 116
                                                                                                                                                                                                                                                                                                                                                                                                                    QAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 124
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                                                                                                              EEDFERARRFLYQCFKRTDTPPSGAWLDFAA------DGRMRRLFTLRQYFGILYR 329
                                                                                                                                                      ENSIITSSMTDHRFHCLLE--FQNERMDFYESRG----
                                                                                                                                                                                                                                                                                                                                                   AWLEVISEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPTHNNTMIMR-RSVIDGG 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PatentIn version 3.0
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1999-07-19
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12.5%; Score 228.5; DB 10; 23.6%; Pred. No. 6.1e-14; ative 68; Mismatches 99;
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                                                                                                                                                                                                                                                                                                                -----DASGHFLTAEPLPTNQAVLSGRNVCKKL 149
                                                                            ---SFLAFAVLFLGKYNHWLSKQQKKLQTL---FRIVYK
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US-09-900-038A-1
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CURRENT FILING DATE: 2001-01-22
PRIOR APPLICATION NUMBER: PCT/NL99/00460
PRIOR FILING DATE: 1999-07-19
PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR FILING DATE: 1998-07-22
PRIOR APPLICATION NUMBER: EP98202467.1
PRIOR APPLICATION NUMBER: EP98202467.1
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US-09-767-041-36
US-09-900-038A-1
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LENGTH: 278
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                                                                                                                                                                                                                                                                                                                                                     Sequence 1, Application US/09900038A Patent No. US20020142425A1 GENERAL INFORMATION:
                                                                                      SOFTWARE: PatentIn SEQ ID NO 1
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Best Local Similarity
                                                                                                                                                                                                                                         APPLICANT: Miyake, Katsuhide APPLICANT: Watanabe, Masaki APPLICANT: Iijima, Shinji TITLE OF INVENTION: Beta 1,3-galactosyltransferase and DNA encoding the FILE REFERENCE: 766.53
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TITLE OF INVENTION: STREP
FILE REFERENCE: 2183-4726
                                                                                                                              PRIOR APPLICATION NUMBER: JF 2001-392 PRIOR FILING DATE: 2001-01-05 NUMBER OF SEQ ID NOS: 8
                                                                                                                                                                                                 CURRENT APPLICATION NUMBER: US/09/900,038A CURRENT FILING DATE: 2001-09-21
                                       LENGTH: 31
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                  ORGANISM: Streptococcus agalactiae
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    184 LRYDTER------DWAEDYQF------WYDVSKLGRLAYYPEALVKYRL 220
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Pred. No. 6.6e-14;
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; OTHER INFORMATION: CPS1I
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                                                                                                                                                                                                                    Query Match
Best Local Similarity 23.1
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SEQ ID NO 34
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Best Local Similarity
Matches 86: Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION NUMBER: PCT/NL99/004
PRIOR FILING DATE: 1999-07-19
PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR FILING DATE: 1998-07-22
PRIOR APPLICATION NUMBER: EP98202467.1
PRIOR FILING DATE: 1998-07-22
PRIOR FILING DATE: 1998-07-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILE REFERENCE: 2183-4726
CURRENT APPLICATION NUMBER: US/09/767,041
CURRENT FILING DATE: 2001-01-22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: STREPTOCOCCUS SUIS VACCINES AND DIAGNOSTIC TESTS FILE REFERENCE: 2183-4726
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQ ID NOS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                ORGANISM: Streptococcus suis FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                     TYPE: PRT
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                                       121
114
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                124 GAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGG 183
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                                                                                                 KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                          MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SAILQDFYKEKSYIDITKITNYFQEYVIKKRYT----QQELSKYFEL--KSTPSITIRKL 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAM 123
IAE---IDFCLVDENGYTKKKRNSNFHVL---TREETVKEFLS-GSNIENNVWCKLYSRD
                                 IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNT--MIMRRS 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          RRFLYQCFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -EIAQGIQK-----TARNDFLQSMGFKTRFDSLEYRQTKAAAAYELPEKDLPEEDFERA 286
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SATLIELIDOK-GNLVYKQRESNKIYLT----NDIRKMLLNRSILAHPTWCVKKKVFDKL 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SIIMSVYNEPLNYVRDSVESILNQTLTDFEFIIVIDNPSRGDLKQFLTEYSVVDNRIKIL 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SVLICAYNVE-KYFAQSLAAVVNQTWRNLDILIVDDGSTDGTL-AIAKDFQKRDSRIKIL 63
                                                                        KYYKKI-NGGLADARNFGLEHAT-----GKYIAFVDSDDYIEVAMFERMHDNITEYNAD 113
                                                                                                                                                       MNDLISVIVPIYNVQDYLDKCINSIINQTYTNLEVILVNDGSTDDSEKICLNYMKNDGRI
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PatentIn version 3.0
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                                                                                                                                                                                                                                                     11.5%; Score 210; DB 10; 23.1%; Pred. No. 3.2e-12;
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                                                                                                                                                                                                                                      66;
                                                                                                                                                                                                                                  Mismatches 124;
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                                                                                                                                                                                                                                                                          Length 322;
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RESULT 11
US-09-816-028A-27
; Sequence 27, Application US/09816028A
; Patent No. US20020042369A1
; GENERAL INFORMATION:
; APPLICANT: Gilbert, Michel
; APPLICANT: Wakarchuk, Warren W.
; APPLICANT: National Research Council of Canada
; TITLE OF INVENTION: Campylobacter Glycosyltransferases for Biosynthesis
; TITLE OF INVENTION: Gangliosides and Ganglioside Mimics
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Best Local Similarity
Tatches 75; Conserve
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US-09-879-959-10
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US-09-879-959-10
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SEQ ID NO 10
LENCTH: 972
TYPE: PRT
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APPLICANT: Kumari, Kshama
APPLICANT: Kumari, Kshama
APPLICANT: DeAngelis, Paul
TITLE OF INVENTION: STREPTOCOCCUS EQUISIMILIS HYALURONAN SYNTHASE GENE AND EXPRESS
TITLE OF INVENTION: IN BACILLUS SUBTILIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 CURRENT FILING DATE: 2001-09-12
PRIOR APPLICATION NUMBER: 09/469,200
PRIOR FILING DATE: 1999-12-21
PRIOR APPLICATION NUMBER: 09/178,851
PRIOR FILING DATE: 1998-10-26
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CURRENT APPLICATION NUMBER: US/09/879,959
CURRENT FILING DATE: 2001-09-12
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         63 LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               3 PLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKI 62
                                                                                                                                                                                                                                                                                                                              QKTARNDFL---QSMGFK-----TRFDSLE----YRQTKAAAYE 272
                                                                                                                                                                                                                                                                                                                                                                                                                      DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   V--YTTNRNVNPDGSLIA----NGYNWPEFSREKLTTAMI-----AHHFRMFTIRAWHLT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NIDLVTR-----LENYPFKLKREFSHYFDAKVIKEKVKCLNKMYSTDCLDNEFLPI
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                                                                                                                                                                                                                                                                                  QK--KNHFVVVNQSLNRQGITYYNYDEFDDLDESRKYIFNKTAEYQ
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FILE REFERENCE: 019633-000111US
CURRENT APPLICATION NUMBER: US/09/816,028A
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: US 60/118,213
PRIOR APPLICATION NUMBER: US 60/118,213
PRIOR APPLICATION NUMBER: US 09/495,406
PRIOR FILING DATE: 1999-02-01
PRIOR FILING DATE: 2000-01-31
NUMBER OF SEQ ID NOS: 49
SOFTWARE: PATENTIN Ver. 2.1
SEQ ID NO 27
LENGTH: 301
                                                                  ; OTHER INFORMATION: CPS1J
US-09-767-041-35
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence 35, Application US/09767041 Patent No. US20020055168A1 GENERAL INFORMATION:
Query Match
Best Local Similarity
                                                                                                                                                                                                                           SOFTWARE:
SEQ ID NO 35
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TITLE OF INVENTION: STREPTOCOCCUS SUIS VACCINES AND DIAGNOSTIC TESTS FILE REFERENCE: 2183-4726
                                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR FILING DATE: 1998-07-22
PRIOR APPLICATION NUMBER: EP98202467.1
PRIOR FILING DATE: 1998-07-22
                                                                                                                                                                                                                                                                                                                                                                                PRIOR APPLICATION NUMBER: PRIOR FILING DATE: 1999
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CURRENT FILING DATE: 2001-01-22
                                                                                                                                                                                                                                                                     NUMBER OF SEQ ID NOS:
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                                                                                                                                  ORGANISM: Streptococcus suis FEATURE:
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OTHER INFORMATION: OH4384 (ORF 6a of lipooligosaccharide (LOS)
                                                                                                                                                                                  TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ORGANISM: Campylobacter jejuni
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                                                                                                           NAME/KEY: misc_feature
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                                                                                                                                                                                                       LENGTH: 322
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             216 NNSICNTKNEVLVKNNIQELQLVL -- NYLRQNYILNKYCSVLYVLIKYLLY 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      222 ANQV-SSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLEYRQTKAAAY 271
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         5 VSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILA 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PIHNNTMIMRRSVIDG----GLRYDTERDWAEDYQFWYD-VSKLGRLAYYPEALVKYRLH 221
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             NEKNLGLLRARYEGV-KVANS-----PYIMFLDPDDYLELNACEECIKILDEQD-EVDLV 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FFNAIVESNVISYKKFDFNSGFYSKKEFVKKIIAKKNLYWTMWGK---------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---LIRKKLYLEAFASLRLEKDVKINMAEDVLLYYPMLSQAQKIAYMNCNLYHYVPN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Smith, Hilda
                                                                                                                                                                                                                                                  PatentIn version 3.0
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1999-07-19
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  10.7%;
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Pred. No. 7.3e-11;
6; Mismatches 100;
Score 194.5; DB Pred. No. 9e-11;
                      10;
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                    Length 322;
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US-09-816-028A-29
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                                                                                                                                                                                                                                                                                                                                                                                                                        US-09-816-028A-29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQ ID NO 29
LENGTH: 303
TYPE: PRT
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                                                                                                                                                                                                                                                                                                                               Matches
                                                                                                                                                                                                                                                                                                                                                     Best Local
                                                                                                                                                                                                                                                                                                                                                                        Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: Gilbert, Michel
APPLICANT: Wakarchuk, Warren W.
APPLICANT: National Research Council of Canada
TITLE OF INVENTION: Campylobacter Glycosyltransferases for Biosynthesis
TITLE OF INVENTION: Gangliosides and Ganglioside Mimics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FILE REFERENCE: 019633-000111US
CURRENT APPLICATION NUMBER: US//9/816,028A
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: US 60/118,213
PRIOR FILING DATE: 1999-02-01
PRIOR APPLICATION NUMBER: US 09/495,406
PRIOR FILING DATE: 2000-01-31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQ ID NOS: 49 SOFTWARE: PatentIn Ver. ?
                                                                                                                                                                                                                                                                                                                                                                                                                                        OTHER INFORMATION: Campylobacter glycosyltransferase B (CgtB) beta-1,3 OTHER INFORMATION: galactosyltransferase from C. jejuni serotype O:2 OTHER INFORMATION: (strain NCTC 11168)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ORGANISM: Campylobacter jejuni FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  148 KNFMNLYINNIFSTPVCKLYKKRYITDLFQENQWLGEDLLFNLHYLKNIDRVSYLTEHLY 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             184
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                                             111 GGGKIDLLCFEAFITNAKKSIKKL--NIKQGKYNNKEFTMQILKTKNPFWTMWAKIIKKD 168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          277 DLPEEDFE
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172 TMIMRRSVIDGGLRYDTERDWAEDYQFWYDVSKL-GRLAYYPEALVKYRLHANQV-----
                                                                                        125 AWLE-----VLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPF----GNPIHNN 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   63
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                                                                                                                                          64 NEENLKLLRARYEGA-KVATS-----PYIMFLDSDDYLELNACEECI------KILDMG 110
                                                                                                                                                                                     65 QAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 124
                                                                                                                                                                                                                                5 VSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILA 64 ::::: |||||| |::|:::||| | ::|||| |::|||| 63 | 1511LPTYNVEKYIARALESCINQTFKDIEIIVVDDCGNDKSIDIAKEYASKDDRIKIIH 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -TNHSGVSNARNHGIKR-----STAEYIMFVDSDDVVDSRLVEKLYFNIIKSRSDLS-G
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                                                                                                                                                                                                                                                                                                                           Score 194; DB 10;
Pred. No. 9.2e-11;
6; Mismatches 97;
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US-09-765-272-200
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US-09-765-272-200
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                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                 Matches 68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
233 QHEIAQGIQKTARNDFLQSMGFKTRFDSLEYRQ-------
                                  149 KLYKARLFEQLRFDIGKLGEDGYLNQKVYLLSEKVIYLNKSLYAYRIRKGSLSRVWTEKW 208
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                                                                                                        111 FHILGD---
                                                                                                                                      142 HHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGGLRYDTER------DWA 193
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                                                                                                                                                                                                                                                             Local Similarity
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NAME: Brookes, A. Anders
REGISTRATION NUMBER: 36,3
REFERENCE/DOCKET NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TELECOMMUNICATION INFORMATION: (301) 309-8504
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SOFTWARE: ASCII Text
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch, 1.4Mb storage
COMPUTER: HP Vectra 486/33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Choi et. al. TITLE OF INVENTION: Streptococcus pneumoniae Antigens and Vaccines NUMBER OF SEQUENCES: 452
                                                                                                                                                                                                                                                                                                                                                                                                                      MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
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                                                                                                                                                                                                       LAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMGAWLEVLSEEKDGNRLAR 141
                                                                                                                                                                                                                                           LDSIITQTYKNIEIVVVNDGSTDASGEICKEFSEMDHRILYIEQ-ENAGLSAARNTGLNN 60
                                                                                                                                                                         MS-----GNYVTFVDSDDWIEQDYVETLYKKIVEYQADIAVGNYYSF--NESEG--MFY 110
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SSKHSVRQHEIAQGIQKTARN 246
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ADDRESSEE: Human Genome Sciences, STREET: 9410 Key West Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: 08/961,083 FILING DATE: <Unknown>
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STATE: Maryland
                                                                                                                                                                                                                                                                                                                                                                                                                                    TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LENGTH: 674 amino acids
                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                    TYPE: protein
DESCRIPTION: SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (301) 309-8512
                                                                                                                                                                                                                                                                                                     10.5%; 5c.
21.2%; Prec
64;
                                                                                                      ----SYYEKVYDNVSIFEN-----LYETQEMKSFALISAWG 148
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                                                                                                                                                                                                                                                                                                                              Score 191.5; DB 1
Pred. No. 4.7e-10;
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                                                                  ----RLAYYPEALVKYRLHANQVSSKHSVR- 232
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 ---TKAAAYELPEKDL 278
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OTHER INFORMATION: glycosyltransferase from C. jejuni OH4384 (ORF 12a; OTHER INFORMATION: of lipooligosaccharide (LOS) biosynthesis locus) US-09-816-028A-39
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APPLICANT: Wakarchuk, Warren W.
APPLICANT: Wakarchuk, Warren W.
APPLICANT: Wakarchuk, Warren W.
APPLICANT: National Research Council of Canada
TITLE OF INVENTION: Campylobacter Glycosyltransferases for Biosynthesis of
TITLE OF INVENTION: Gangliosides and Ganglioside Mimics
FILE REFERENCE: 01933-00011095
FILE REFERENCE: 01933-00011095
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hypothetical	AE2189	N	316	11.1	203
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glycosyl tr	A64099	ν	250	11.2	204.5
probable glycosylt	AC0974	N	344	11.2	205
probable gl	в83557	N	299	11.2	205
rhamnosyltransfera	T00087	N	311	11.3	205.5
hypothetical prote	AD2189	N	323	11.3	206.5
glucuronosyltransf	T09595	N	972	11.4	208.5
probable ga	E81318	N	389	11.4	208.5
capsular polysacch	A70037	N	344	11.5	210.5
glycosyl transfera	T44647	2	322	11.7	213
glycosyl transfera	E71703	N	280	11.7	214
glycosyl transfera	F95205	N	301	11.8	216
spore coat polysac	G70036	N	344	11.9	216.5

ALIGNMENTS

lactor N-neotetraose biosynthesis glycosyl transferase NMA0524 [imported] - Neisseria C;Species: Neisseria meningitidis
C;Species: Neisseria meningitidis
C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C;Accession: H81970
C;Accession: H81970
C;Accession: H81970
C;Accession: H81970
C;Accession: Mayels, K.; Leather, S.; Moule, S.; Churcher, C.; Klee, S.R.; Mo; Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Mungall, K.; Quail, M.A.; Rajandre
Nature 404, 502-506, 2000
A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z2491
A;Accession: H81970
A;Accession: H81970
A;Status: preliminary
A;Residues: 1-346 <-PAR>
A;Residues: 1-346 <-PAR>
A;Cross-references: GB:AL162753; GB:AL157959; NID:g7379120; PIDN:CAB83816.1; PID:g737
A;Experimental source: serogroup A, strain Z2491
C;Genetics:
A;Gene: 1gth; NMA0524
C;Superfamily: Neisseria meningitidis glycosyl transferase A Best Matches Query Match 299 301 239 241 179 181 119 121 61 61 Local IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI 180 IAMGAWLEVLSEEKDGNRLARHHRHGKIWKKPTRHEDIADFFPFGNPIHNNTMIMRRSVI 328; Similarity Conservative 93.98; 10; Score 1712; DB 2; Pred. No. 1.6e-134; .0; Mismatches 8; Length Indels 346 2 Gaps 300 240 60 60 238 ۲.

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A;Cross-references: EMBL:U25839; NID:g973183; A;Note: the nucleotide sequence was submitted C;Genetics:
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A;Title: Molecular analysis of a locus for the biosynthesis ar A;Reference number: S70812; MUID:96414473; PMID:8817494
A;Accession: S70813
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C;Species: Neisseria meningitidis
C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 21-Jul-2000
C;Accession: S70813
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C;Superfamily: Neisseria meningitidis glycosyl transferase
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Status: preliminary
A;Molecule Type: DNA
A;Residues: 1-349 <TET>
A;Cross-references: GB:AE002541;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; A;Title: Complete genome sequence of Neisseria meningitidis serogroup B A;Reference number: A81000; MUID:20175755; PMID:10710307 A;Accession: D81027
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; ri, H.; Ohn, H.; Vanathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Science 287, 1809-1815, 2000
                                                                                                                A; Gene:
                                                                                                                                                                                          A; Molecule type: DNA
A; Residues: 1-333 < JEN>
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Query Match
                                                   Superfamily: Neisseria meningitidis Reywords: glycosyltransferase
                                                                                          Start codon:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QKTARNDFLQSMGFKTRFDSLEYRQIKAVAYELLEKHLPEEDFERARRFLYQCFKRTDTL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IAMGAWLEVLSEEKDGNRLARHHEHGKIWKKPTRHEDIADFFPFGNPIHNNTMIMRRSVI
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B, strain MC58
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Pred. No. 5.2e-1
                Score 1617.5;
                                                                                                                                                                                                                                 sequence not shown; translation
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                                                                       glycosyl
                                                                                                                                                   PIDN:AAC44084.1;
to the EMBL Data
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                DB
              1;
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                333;
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Library, Ap
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                                                                                                                                                   April 1995
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₽ 4
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A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Vente A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630; PMID:7542800
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     glycosyl transferase homolog HI1578 - Haemophilus influenzae (strain C;Species: Haemophilus influenzae C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 28-JuC;Accession: H64130
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A; Residues: 1-323 <TIGR>
A; Cross-references: GB:U
C; Superfamily: Neisseria
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Matches 137; Conserv
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                                                                                                                                                   GGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGIQ
                                                                                                                                                                                                                                                                                                                  LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122
                                                                                                                                                                                                                                                                                                                                                                      PLVSVIVCAYNAEQYIDESISSIINQTYENLEIIVINDGSTDLTLSHLEEISKLDKRIKI
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              SGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
                                                                                       KTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTPP
                                                                                                                                HKLIFNKDYPYAEDYKFWSEVSRLGCLANYPEALVKYRLHGNQTSSVYNHEQNETAKKIK
                                                                                                                                                                                                            MGSYLEIIVEKECG-IIGSQYKTGDIWKNPLLHNDICEAMLFYNPIHNNTMIMRANVYRE
                                                                                                                                                                                                                                                                                          ISNKYNLGFINSLNIGL-----GCFSGKYFARMDADDIAKPSWIEKIVTYLEKNDHITA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         acid sequence not shown; translation
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GB:U32832;
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                                                   -----SVSLLEIYHVDKSNKVLKSILYEMYMSLDKYT
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jitidis glycosyl transfer
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 611.5;
Pred. No. 3.8
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3.8e-43;
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28-Jul-2000

Rd

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Gaps

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PID:g1574422

64

62

181

177

241

118

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A;Cross-references: GB:AL591985; PIDN:CAC49255.1; PID:g15140741; GSPDB:GN00167
A;Experimental source: strain 1021, megaplasmid pSymB
R;Galibert, F.; Finan, T.M.; Long, S.R.; Puhler, A.; Abola, P.; Ampe, F.; Barloy
pela, D.; Chain, P.; Cowie, A.; Davis, R.W.; Dreano, S.; Federspiel, N.A.; Fishe
L.; Hyman, R.W.; Jones, T.
Science 293, 668-672, 2001
A;Authors: Kahn, D.; Kahn, M.L.; Kalman, S.; Keating, D.H.; Kiss, E.; Komp, C.;
hebault, P.; Vandenbol, M.; Vorholter, F.J.; Weidner, S.; Weils, D.H.; Wong, K.;
A;Title: The composite genome of the legume symbiont Sinorhizobium meliloti.
A;Reference number: A96039; MUID:21368234; pMID:11474104
C;Genetics:
R;Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.; Daly, M.J.; Bennett, G.N.; Koonin, E.V.; Smith, D.R. J. Bacteriol. 183, 4823-4838, 2001
A;Title: Genome Sequence and Comparative Analysis of the A;Reference number: A96900; MUID:21359325; PMID:21359325
                                                              RESULT 6
B97168
C; Species: Clostridium acetobutylicum
C; Species: Clostridium acetobutylicum
C; Date: 14-Sep-2001 #sequence_revision 14-Sep-2001 #text_chi
C; Accession: B97168
R; Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.S.
R; Nolling, J.; Breton, G.; Omelchenko, M.V.; Smith, D.R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     probable glycosyltransferase protein SMb21189 [imported] - Sinorhizobium meC;Species: Sinorhizobium meliloti
C;Date: 24-Aug-2001 #sequence_revision 24-Aug-2001 #text_change 30-Sep-2001
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A;Title: The complete sequence of the 1,683-kb pSymB megaplasmid
A;Reference number: A95842; MUID:21396508; PMID:11481431
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R;Finan, T.M.; Weidner, S.; Wong,
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A; Residues: 1-367 < KUR>
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Pred. No. 2e-19;
68; Mismatches 1:
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                                                      Markarova, K.S.; Smith, D.R.
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    Sinorhizobium meliloti

                    Solvent-Producing
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; Fisher, R.F.
                      Bacterium
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A; Note: wblC
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A; Molecule type: DNA
A; Residues: 1-333 <KUR>
A; Residues: 1-333 <KUR>
A; Cross-references: GB: AE001437; PIDN: AAK80133.1; PID: g15025169; GSPDB: GN00168
A; Experimental source: Clostridium acetobutylicum ATCC824
C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gene 237, 321-332, 1999
A;Title: The genes responsible for O-antigen synthesis of Vibrio cholerae O139
A;Reference number: Z22749; MUID:99453293; PMID:10521656
A;Accession: T44330
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C;Species: Vibrio cholerae
C;Date: 21-Jan-2000 #sequence_revision 21-Jan-2000 #text_
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A; Status: preliminary
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                                                                                                                                  MGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDG
                                                                                                                                                                               ISRV-NKGLPYSLNEAI-SVSKA----NYIARMDADDISLPERLETQLAVMENNPDIGV 118
                                                                                                                                                                                                                             LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122
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Pred. No. 1e
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Pred. No. 1.
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glycosyltransferase [imported] - Clostridium acetobutylicum
C:Species: Clostridium acetobutylicum
C:Species: Clostridium acetobutylicum
C;Date: 14-Sep-2001 #sequence_revision 14-Sep-2001 #text_change 14-Sep-2001
C;Accession: H97167
R;Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.S.; Zeng, Q.; Gibson,
J.; Daly, M.J.; Bennett, G.N.; Koonin, E.V.; Smith, D.R.
J. Bacteriol. 183, 483-4838, 2001
A;Title: Genome Sequence and Comparative Analysis of the Solvent-Producing Bact
A;Reference number: A96900; MUID:21359325; PMID:21359325
A;Accession: H97167
A;Status: preliminary
A;Residues: 1-333 <KUR>
A;Cross-references: GB:AE001437; PIDN:AAK80131.1; PID:g15025167; GSPDB:GN00168
A;Experimental source: Clostridium acetobutylicum ATCC824
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A;Note: Nostoc sp. strain PCC 7120 is a synonym of Anabaena sp.
C;Date: 14-Dec-2001 #sequence_revision 14-Dec-2001 #text_change
C;Accession: AG2188
R;Kaneko, T; Nakamura, Y.; Wolk, C.P.; Kuritz, T.; Sasamoto, S.
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A;Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium Ana A;Reference number: AB1807; MUID:21595285; PMID:11759840
A;Accession: AG2188
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A;Experimental source: strain PCC 7120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-321 < KUR>
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Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                      AVAYYPS --- LRFSQEYIRLSIAINLMRWFG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                G-GLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MGAWLEVLSEE-KDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVID 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                              RTDTPPSGAWLDFAADG-RMRRLFTLRQYFG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PKVSVVIPAYNAMPYLPETLESVLRQTYHDFEVVVVNDGSSDNTEEWVS--QILDPRLKL 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       P.; Kuritz, T.; Sasamoto, S.; Watanabe, A.; M.; Takazawa, M.; Yamada, M.; Yasuda, M.;
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R;Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.S.; Zeng, Q.; Gibs.; Daly, M.J.; Bennett, G.N.; Koonin, E.V.; Smith, D.R.
J. Bacteriol. 183, 4823-4838, 2001
A;Title: Genome Sequence and Comparative Analysis of the Solvent-Producing 1 A;Reference number: A96900; MUID:21359325; PMID:21359325
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A; Molecule type: DNA
A; Residues: 1-336 < KUR>
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                                                                                                                                                                                                                                             LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122 ::: :: ||: ||| ||: :| :: :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILA 64
                                                                                        GGLR-YDTERDWAEDYQFWYDVSKLG-RLAYYPEALVKYRLHANQVSSKHSVRQHEIAQG 239
                                                                                                                                                                        MGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPI-HNNTMIMRRSVID 181
                                                                                                                                                                                                                                                                                                         PLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKI 62
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        IQKTARNDFLQSMGFKTRFDSL
                                                                                                                                     LGTRIEAFGDIDEKQKTI----YNSAFSIKFDSQNIEQVFLTSCAIPHPSVMFKKDSIVK 173
                                                                                                                                                                                                                         ISR-EHRGLVDSLNEGIN-IAR-----GKYIARMDADDISINNRIEKQFEFLELNKDVDI 117
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                                                                                                                                                                                                                                                                                                                                                                                           Score 271; DB 2;
Pred. No. 7.8e-15;
4; Mismatches 105;
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Pred. No. 6.4e-15;
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glucosyltransferase [imported] - Nostoc sp. (strain PCC 7120)
C;Species: Nostoc sp.
A;Note: Nostoc sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120
C;Date: 14-Dec-2001 #sequence_revision 14-Dec-2001 #text_change 30-Jun-2002
C;Accession: A12091
R;Kaneko, T.; Nakamura, Y.; Wolk, C.P.; Kuritz, T.; Sasamoto, S.; Watanabe, A.; Iriguchi Nakazaki, N.; Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada, M.; Yasuda, M.; Tabata, S. DNA Res. 8, 205-213, 2001
A;Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium Ana A;Faterence number: AB1807; MUID:21595285; PMID:11759840
A;Accession: A12091
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R;Takami, H.; Nakasone, K.; Takaki, Y.; Maeno, G.; Sasaki, R.; Masui, N.; Fuji, F.; Nucleic Acids Res. 28, 4317-4331, 2000
A;Title: Complete genome sequence of the alkaliphilic bacterium Bacillus halodurans A;Reference number: A83650; MUID:20512582; PMID:11058132
A;Recession: B84114
A;Recession: B84114
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                                                                                                                                                                                                                                   A;Cross-references: GB:BA000019; PIDN:BAB73987.1; A;Experimental source: strain PCC 7120
                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 1-343 < KUR>
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                                                                                                                                                                                                                                                                                                                    A; Status: preliminary
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Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
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                                                                   5
                                           VSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILA 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TMK-AKIDYINDTNKKDKVDYL
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                       LSVIIPVYNSESSVAETLRSVLAQTYRDLEIIIVDDGSTDKSIDICKQFQ--DERIRIIH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RLIHNKNNRGLSYSLAEGV-SLAKA-----PWIARMDADDVSFKDRLAVQMDHVKAHSEL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14.2%; Score 258; DB 2.
31.5%; Pred. No. 7e-14;
                                                                                                                                13.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ----EIRKVPTTHKEIANLIWTCPF---IHPTVLFKKD
                                                                                                                           Score 252.5;
Pred. No. 2.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Mismatches
                                                                                                            Mismatches
                                                                                                        5; DB 2;
2.8e-13;
nes 100;
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                                                                                                                                                                                                                                                       PID:g17131380;
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                                                                                                                                                 Length
                                                                                                                                                   343;
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hypothetical protein alr3071 [imported] - Nostoc sp. C:Species: Nostoc sp. strain PCC 7120 is a synonym of C:Date: 14-Dec-2001 #sequence_revision 14-Dec-2001 C:Accession: AH2189 R:Kaneko, T.; Nakamura, Y.; Wolk, C.P.; Kuritz, T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   glycosyltransferase BH3657 [imported] - Bacillus halodurans (strain C-125)
C;Species: Bacillus halodurans
C;Date: 01-Dec-2000 #sequence_revision 01-Dec-2000 #text_change 15-Jun-200
C;Accession: A84107
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A84107
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A;Residues: 1-732 <STO>
A;Cross-references: GB:AP001519; GB:BA000004; NID:g10176109; PIDN:BAB07376.1; GSPDB:G
A;Experimental source: strain C-125
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            R;Takami, H.; Nakasone, K.; Takaki, Y.; Maeno, G.; Sasaki, R.; Mucleic Acids Res. 28, 4317-4331, 2000
A;Title: Complete genome sequence of the alkaliphilic bacterium A;Reference number: A33650; MUID:20512582; PMID:11058132
A;Sccession: A84107
A;Status: preliminary
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Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SSKHSVRQHEIAQGI--QKTARN-DFLQSMGFKTRFDSLEYRQTKAAAYELP 274
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AWLEVLSEEKDGNRLARHHKHGK---IWKKPTRHEDIAAFFPF-GNPIHN-NTMIMRRSV 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         QAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG
                                                                                                                                                                                                                                                                                                                        RQHEIAQGIQKTARNDFLQSMGFKTRFDSLE--YRQTKAAAYELPEKD----LPEEDFER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KYLKTEINSGAYVARNIALQQAA-----GEFVTINDADDWSHPAKIETQVNHLLEHPQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SA-NVLKQYESWERILVKTQAYNPEFIERWGNRAKAYQLRYLARRATRGRSP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LDTIKFQENLYGEVEDFYFDDSFRQSEDIECWLRIALQTTWKIEGIPEALTLYRVNMGGL
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                                                                                                                                                                                                                                                       ARRFLYQCFKRTDTPPSGAWLDFAADGRMRRLFTLRQYFGIL----YRLI
                                                                                                                                                                                                                                                                                                                                                                              RKNPVMENLGFWDSVRFGADGEFKRRLKKVFGEKAVVDLASGPYSFQRQTKGSLTGNHAF
                                                                                                                                                                                                                                                                                                                                                                                                                   RRSVIDGGLRYDTERDWAEDYQFWYDVSKL-GRLAYYPEALVKY---RLHANQVSSKHSV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNP----IHNNTMIM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ID------GGLRYDTERDWAEDYQFWYDVS--KLGRLAYYPEALVKYRLHANQV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 13.5%; Score 247; DB 2; ilarity 24.9%; Pred. No. 2.3e-12; Conservative 59; Mismatches 114
Y.; Wolk, C.P.; Kuritz, T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -GKPLGIYQMP-KLTDITPEYLFCRNPISNGSSVVIRRAV
                                                                                                                                                                                                                                                                                                KEYFDSYSHYHRVAESLRYDFPQEPRLFAVPEPMWPQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches 114;
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                                                                                                                                                                                                              RRHFDVIIASEFRLL
                                                                                                        sp.
                                       Anabaena sp.
#text_change
Sasamoto,
                                                                                                        (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 732;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  R.; Masui, N.; Fuji, F.;
                                                                                                          PCC 7120)
                                                                                                                                                                                                              387
  s
;
                                         strain PCC
30-Jun-2002
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  Watanabe,
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                                                              PCC
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A; Experimental s
C; Genetics:
A; Gene: alr2836
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AE2160
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A; Residues: 1-322 <KUR>
A; Cross-references: GB:BA000019; PIDN:BAB74535.1; PID:g17131930; GSPDB:GN00179
A; Cross-references: GB:BA000019; PIDN:BAB74535.1; PID:g17131930; GSPDB:GN00179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Nakazaki, N.; Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada, M.; Yasuda, M.; Tabata DNA Res. 8, 205-213, 2001
A;Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium A;Reference number: AB1807; MUID:21595285; PMID:11759840
A;Accession: AE2160
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          glycosyltransferase alr2836 [imported] - Nostoc sp. (strain PCC 7120) C;Species: Nostoc sp. (strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120 is
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A;Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium Ana A;Reference number: AB1807; MUID:21595285; PMID:11759840

A;Accession: AH2189
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                                    124 GAWLEVLSEEKDGN--RLARHHKHGKIWKKPTRHEDIAAF--
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                                                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity es 96; Conserv
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                                                                                                              FQA-NQGQGGAFNAGF-----AAATGEVVAFLDADDVWKPHKLQRIV-EVFQTSDVVGV 114
                                                                                                                                                                                                                                                                     ISVIISNYNYARYLSRAINSVLAQTHSDIEIVIVDDGSTDNSRDVITQLQEQAPDKIKPI 62
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28.5%; Pred. No. 1.6e-12;
ative 61; Mismatches 112;
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                                FPFGNPIHNNT 172
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                                                                                       HSVRQHEIAQ--GIQKTAR--NDFLQSMGFKTRFD---SLEYRQTKAAAYELPEKDLPE-
                                                                                                                                      LAYRREVLEKVFPIDPVKWRIWA-DGCIIYCTAFLGKIKTLQENLAYYRIHGANNHMSAA
                                                                                                                                                                     MIMRRSVIDGGLRYDTE--RDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHA--NQVSSK 228
                                                                                                                                                                                                         MHHLDII-----DGNDKTIDQASTQG-----PKLSEDLASVILQTGNAWCFP-----PTSG
                                                                 SATSEQEAKSQAGIEMINQYINDFLVRIGYGARVDLSRNLQYRRTK--YYQRSQWDLREV
                              --EDFERA---RRFLYQCFK---RTD 298
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Search completed: December 2, 2002, 12:00:07 Job time: 17.4445 secs

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Y33B_MYCPN
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PLVSVIVCAYNAEQYIDESISSIINQTYENLEIIVINDGSTDLTLSHLEEISKLDKRIKI 64

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P22639;
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"Identification and characterization of hetA, a gene that acts ea:
in the process of morphological differentiation of heterocysts.";
J. Bacteriol. 172:3131-3137(1990).
-!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
                                                                                                              SEQUENCE 322 AA;
                                                                                                                                                                                                                                                                                                                                                            use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                            This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
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15-JUN-2002 (Rel. 41, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Putative glycosyl transferase alr2836 (EC 2.-...).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     cyanobacterium Anabaena sp. strain DNA Res. 8:205-213(2001).
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"Complete genomic sequence of the filamentous nitrogen-fixing "Complete genomic sequence of the filamentous nitrogen-fixing "Complete genomic sequence of the filamentous nitrogen-fixing "Complete genomic sequence of the filamentous nitrogen-fixing".
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                                                                                                                                                              PIR; B35391; B35391.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
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TIGR; MJ1057;
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                                                                                      InterPro; IPR001173; Glycos_transf_2.

Pfam; PF00535; Glycos_transf_2; 1.

Hypothetical protein; Transferase; Complete protein SEQUENCE 290 AA; 35099 MW; 3F6AlB221C420D74
                                                                                                                                                                                                                                                                                                              entities requires a license agreement (S or send an email to license@isb-sib.ch).
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MEDLINE=96337999; PubMed=8688087;
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                                                                                                                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute. The European Bioinformatics Institutions as long
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                                                                                                                                                            Complete SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                  InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
                                                                                                                                                                                                                                                                     EMBL; U32768; AAC22526.1;
HSSP; P39621; 1QGQ.
TIGR; HI0868; -.
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STRAIN-Rd / KW20 / ATCC 51907;
MEDLINE-95350630; PubMed-7542800;
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Pred. No. 1.1e-09;
i2; Mismatches 93;
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                                                                                                                                                                                                                                                                                          EMBL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sofia H.J., Burland V., Daniels D.L., Plu "Analysis of the Escherichia coli genome. region from 76.0 to 81.5 minutes.";
                                                                                                                                              PIR; B33276; B33276.
EcoGene; EG11266; yibD.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
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Pfam; PF00535; Glycos_transf_2; 1.
Exopolysaccharide synthesis; Transferase; Glycos
SEQUENCE 266 AA; 30748 MW; 163268A4210EB47B
                                                                                                                                                    the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed. entities requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                               "Molecular analysis of the ams operon required for exopolysaccharide synthesis of Erwinia amylovora.";
Mol. Microbiol. 15:917-933(1995)
-i- FUNCTION: INVOLVED IN THE BIOSYNTHESIS OF AMYLOVORAN WHICH FUNCTIONS AS A VIRULENCE FACTOR.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Erwinia amylovora
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01-NOV-1997 (Rel. 35, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Amylovoran biosynthesis glycosyl transferase amsE (EC 2.-.-).
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                                                                                                                                                                                                                                    between
                                                                                                                                                                                                                                                                                                                                                                                              Bugert P., Geider
                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Erwinia.
                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=95319333;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         NCBI_TaxID=552;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           219
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                Local Similarity
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                                                                                                                                                                                                                                                                               PATHWAY: Exopolysaccharide biosynthesis.
SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
                                                                                                                                                                                                  SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation - European Bioinformatics Institute. There are no restrictions on its by non-profit institutions as long as its content is in no way
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NADWCFRETGETWQSIPTDRLRSTGVLTGPDWLRMGLSSRRWTH-VVWMGVYRRDVI---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GA-----WLEVLSEE-----KDGNRL---ARHHKHGKIWKKPTRHEDIAAF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LSVIIPLYNAGDDFRTCMESLITQTWTALEIIIINDGSTDNSVEIAKYYAENYPHVRLLH 67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LPEKDLPEEDFERARRFLYQCFKRTDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NTSVSRLHRQGNKNLNYQRHYIKITRLLEKLNRNYADKIMIYPEFHQQITYEALRVCHAV 278
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ANQVSSKH-----SVRQH--EIAQGIQKTARNDFLQSMGFKTRFDSLEYRQTKAAAYE
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 Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                              PubMed=7596293;
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              10.3%;
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 42;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 189.5; DB 1
Pred. No. 2.7e-08;
              Score 187.5;
Pred. No. 2.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
 Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              299
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    266
                2.8e-08;
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                                                                            Glycosyltransferase
                                                                                                                                                                      . Usage by and fo
http://www.isb-sib.
                             DB 1;
                                                              CRC64;
Indels
                             Length
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31;
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AMSB_ERWAM
                                                                                                        Matches
                                                                                                                                     Query Match
                                                                                                                                                           EMBL; X77921; CAA54883.1; ...
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Exopolysaccharide synthesis; Transferase; Glycos_transf_2; 1.
AA; 34788 MW; 99D0EE3080E6EC06
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Amylovoran biosynthesis glycosyl transferase
                                                                                                                                                                                                                                                         entities requires a license agreement (See http://www.isb·sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AMSB_ERWAM
Q46632;
                                                                                                                                                                                                                                                                                       use by non-profit institutions as long modified and this statement is not removed.
                                                                                                                                                                                                                                                                                                     the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in
                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Molecular analysis of the ams operon required synthesis of Erwinia amylovora.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A. STRAIN-EA1/79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bugert P., Geider
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=95319333;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NCBI_TaxID=552;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Erwinia
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                                                                                                                                                                                                                                                                                                                                                                                                 TRANSFERASE WHICH TRANSFERS GALACTOSE FROM LIPID-LINKED AMYLOVORAN-SUBUNIT PRECURSOR. PATHWAY: Exopolysaccharlde biosynthesis.
                                                                                                                                                                                                                                                                                                                                                                                                                                              FUNCTION: INVOLVED IN THE BIOSYNTHESIS OF AMYLOVORAN WHICH FUNCTIONS AS A VIRULENCE FACTOR. MAY FUNCTION AS A GLYCOSYL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Microbiol. 15:917-933(1995)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LSGA--
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LVSVLICAYNVEK--YFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIK
AQNSGLIPSLNIGLDELAKSGGGG---
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                                              SVVIPAYNASESIITTLDCLNEQSYKNFDVIIVDDKSADA----
                                                                          SYLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILAQ 65
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IDGGLRYDTERDWAEDYQFWYDVSKLGR-LAYYPEALVKYRLHANQVSS-----KHSV
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                                                                                                        76;
                                                                                                                        Similarity
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                                                                                                        Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PubMed=7596293;
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                                                                                                                     9.0%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 gamma
                                                                                                        57;
                                                                                                     Score 164; DB 1;
Pred. No. 2.8e-06;
7; Mismatches 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 subdivision; Enterobacteriaceae;
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               ·GEYIARTDADDIASPGW-
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                                                                                                                                                                                   Glycosyltransferase
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RESULT 8
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IDA GGAA_BACSU
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                                                                                                       RA Kunst F. (Ogasawara N., Moszer I., Albertini A.M., Alloni G.,
RA Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
RA Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.,
RA Borriss R., Bruschi C.V., Caldwell B., Cappano V., Carter N.M.,
RA Brouillet S., Bruschi C.V., Caldwell B., Cappano V., Carter N.M.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Chim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G.,
RA Fritz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Galleron N.,
RA Gliseppi G., Guy B.J., Haga K., Halech J., Harwood C.R., Henaut A.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Hilbert H., Kolsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Hilbert H., Kolsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,
RA Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M.,
RA Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M.,
RA Parro V., Pohl T.M., Portetelle B., Rapoport G., Rey M., Reynolds S.,
RA Sekiguchi J., Sekowska A., Seror S.J., Serror P., Shin B.S., Soldo B.,
RA Sekiguchi A., Tanakoshi A., Tanaka T., Terpstra P., Tognoni A.,
RA Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Tognoni A.,
RA Viari A., Wadlenbol M., Vannier F., Vassamott A.,
RA Viari A., Watamanc K., Yamanne K., Yassumoto K., Yata K.,
RT Subtilis. ", Yata K.,
RT Yatawa H.F., Zumstein E., Yoshikawa H., Danchin A.;
RT Subtilis. ", Yata K.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             멍
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01-NOV-1995
15-JUN-2002
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P46917;
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                                                                Nature 390:249-256(1997).
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                                BIOSYNTHESIS
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                                OF.
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01-NOV-1995
15-JUN-2002
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Subtilist; BG11367; 9gaA.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PP00535; Glycos_transf_2; 1.
Transferase; Glycosyltransferase; Complete proteome.
Transferase; Glycosyltransferase; BB3698D9B6856C42 CRC64;
Kunst F.,
             MEDLINE=98044033; PubMed=9384377;
                           STRAIN=168
                                                                                                                                                                                             Minor teichoic acids biosynthesis
                                                                                                                                                                                                                                                                  GGAB_BACSU
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                                                                  Submitted
                                                                                              STRAIN-168;
                                                                                                                                                     Bacteria; Firmicutes;
                                                                                                                                                                Bacillus subtilis
                                                                                                                                                                                                                                                     P46918;
                                        SEQUENCE FROM N.A
                                                                                  Freymond
                                                                                                           SEQUENCE FROM N.A
                                                                                                                                      NCBI_TaxID=1423;
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Z99122; CAB15586.1;
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d (AUG-1994)
Ogasawara N.,
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(Rel.
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32, Last sequence update)
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Moszer I.,
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                                                                    EMBL/GenBank/DDBJ
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Pred. No. 5.2e-06;
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Albertini A.M., Alloni
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Ra Lee S.M., Levine A., Liu H., Masuda S., Mauel C., Medigue C.,

Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,

Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,

Ra Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,

Ra Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,

Ra Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,

Ra Parro V., Pohl T.M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,

Ra Presecan E., Pujic P., Purnelle B., Rapport G., Rey M., Reynolds S.,

Rieger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,

Ra Presecan E., Schleich S., Schroeter R., Scoffone F.,

Ra Sato T., Scanlan E., Schleich S., Schroeter R., Scoffone F.,

Sakiguchi J., Sekowska A., Seror S. J., Seror P., Shin B.S., Soldo B.,

Sekiguchi J., Tamakoshi A., Tanaka T., Tarpstra P., Togononi A.,

Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Togononi A.,

Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Vassarotti A.,

Valari A., Wambutt R., Wedler E., Wedler H., Weltzenegger T.,

Valari A., Wandoutt R., Wedler E., Wedler E., Yoshikawa H., Danchin A.,

The complete genome sequence of the Gram-positive bacterium Bacillus
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Best Local :
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InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Transferase; Glycosyltransferase; Complete proteome.
SEQUENCE 900 AA; 107154 MW; FA66495488C2C62F CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L
Joris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; U13979; AAA73513.1; -. EMBL; Z99122; CAB15585.1; -.
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                                                                           227
                                                                                                                                                      174
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FNHSLITESKNLIDIIKNHEQKIPLFLQYMVMHDLKWKLLIKDISETPLDENEYSEFLTL
                                                                                                                                                                                                                             VIDGGLRYDTERDWAEDYQFW-YDVSKLGRLAYYPEALVKYRLH---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SVLICAYNVEKYFAQSLAAVVNQT--WRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKIL 63
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                                                                           SKHS----
                                                                                                                                                  L--KNIRFDENCKIGEDAKLVNLIISQKKKYGLVKEAKYHYRVREDGSSAMQTAKANKNW 231
                                                                                                                                                                                                                                                                                                                                                                                    GAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIH-----NNTMIMRRS 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AQAQNSGLIPSINIGIDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAM 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SVIMPIYNVELYLTEAIESIINQTIGFENIQLILVNDDSPDKSEIICKEYAQKYPNNIVY 70
                                                                                                                                                                                                                                                                                                            VAIPIFFAEGRTG----EHNLNNKF--SSTRILDVEK-----EPHHILTHCCSTFIKKDA 173
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AKKQNGGVSSARNYGLKY-----AEGRYIQFLDPDDLVSEGTFENVLNFFDEHKNEIDI 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         , V.,
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                                                                       -----VRQHE--IAQGIQKTARNDFLQSMGFK----TRFDSLEYRQTKAA 269
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22.8%;
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Pred. No. 2.
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.2e-05;
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                                                                                                                                                                                                                         -----ANQVS 226
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Best Local S
Matches 74
                                                                                                                                                               COMPLICT
CONFLICT
CONFLICT
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MEDLINE=95350630; PubMed=7542800;
Fleischmann R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F.,
Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M.,
McKenney K., Sutton G., Fitzhugh W., Fields K., Kelley J.M.,
Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M.,
Weidman J.F., Phillips C.A., Spriggs T., Hedblom E., Cotton M.D.,
Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C.,
Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M.,
Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M.,
Spriggs T. Hedblom E.C., Smith H.O.,
                                                                                                                                                                                                                                                                                                             entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                              use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for contentities requires a license.
                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation - the European Bioinformatics Institute. There are no restrictions on its
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16-0CT-2001 (Re
                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                         Hypothetical
                                                                                                                                                                                                                                        InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
                                                                                                                                                                                                                                                                                                   EMBL; M94855; AAA24983.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                Science 269:496-512(1995).
-!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Submitted
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Haemophilus.
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16-OCT-2001 (Rel.
15-JUN-2002 (Rel.
                                                                                                                                                                                                                                                                     TIGR; HI1695;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Venter J.C.;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Whole-genome random sequencing and assembly of Haemophilus influenzae
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 LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122
                                                          SYLICAYNYE -- KYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLA-IAKDFQKRDSRIKI 62
                              SYLMSLYIKENPQFLRECFESLVAQTRQADEIVLVFDGVVTPDLEFVVTEFETK-LPLKL 62
                                                                                                                                                                                                                                                                                   U32842;
                                                                                                     Similarity
                                                                                                                                                                                                          proteome.
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                                                                                                                                           26
46
49
267 /
                                                                                        Conservative
                                                                                                                                                                                                                         protein; Transferase; Glycosyltransferase;
                                                                                                                                                                                                                                                                                     AAC23341.1;
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41, Last annotation updat
transferase HI1695 (EC 2.
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30770 MW;
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                                                                                                                                                 V -> G (IN REF. 1).
D -> E (IN REF. 1).
F -> S (IN REF. 1).
; A2F1A0532737D8C3 CRC64;
                                                                                              Score 146; Db 1,
---- No. 7.2e-05;
                                                                                       Pred. No. 7.26
7; Mismatches
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(EC 2.-.-).
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lsg locus fro
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                                                                                        54;
                                                                                       Gaps
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EXEGULT 11
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RC STRAIN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE-94042869; PubMed-8226645; Glucksmann M.A., Reuber T.L., Walker G.C "Family of glycosyl transferases needed succingglycan by Rhizobium meliloti."; J. Bacteriol. 175:7033-7044(1993).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Succinoglycan biosynthesis protein exoO (EC EXOO OR RB1084 OR SMB20959.
Rhizobium meliloti (Sinorhizobium meliloti).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE=94067019; PubMeg=8248031;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
"Identification and analysis of the Rhizobium mellioti exoAMONP genes"
"Identification and analysis of the Rhizobium mellioti exoAMONP genes"
                                                                                                                                                                                                                                                "The complete sequence of the 1,683-kb pSymB megaplasmid from the N2-fixing endosymbiont Sinorhizobium meliloti.";
proc. Natl. Acad. Sci. U.S.A. 98:9889-9994(2001)
-i- FUNCTION: GLYCOSYLTRANSFERASE REQUITED FOR THE SYNTHESIS OF SUCCINGLYCAN (EPS 1). NEEDED FOR THE ADDITION OF THE FIFTH SUGAR (GLUCOSE), CATALYZES THE FORMATION OF A BETA-1,6 LINKAGE BETWEEN THE FOURTH AND FIFTH SUGAR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=21396508; PubMed=11481431;
Finan T.M., Weidner S., Wong K., Buhrmester J.,
Vorhoelter F.J., Hernandez-Lucas I., Becker A.,
Golding B., Puehler A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     involved in exopolysaccharide biosynthesis located on the exoHKLAMONP fragment."; mol. Gen. Genet. 241:367-379(1993).
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MEDLINE=94067019; PubM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Plasmid pSymB (megaplasmid 2).
Bacteria; Proteobacteria; alpha subdivision;
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                                                                                                                                                          PATHWAY: Exopolysaccharide biosynthesis.
SUBCELLULAR LOCATION: Cytoplasmic.
SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY
                                                                                         CAUTION: Ref.1 sequence differs from that shown frameshift in position 208.
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                                   SWISS-PROT entry is
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Best Local
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PIR; C49348; C49348
PIR; S37029; S37029.
PIR; S39958; S39958.
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    271
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                                         288 RFLYQCFKRTDTPPSGAWLDFAAD------GRMRRL
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                                                                                    SRVLRLDHIDAMI - - AADEAFLRRYALDGLAQKMQHRRMRG-----
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                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                        Bacteria; Firmicutes;
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SEQUENCE FROM N.A.
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RA Azevedo V. Bertero M.G., Bessieres P., Bolotin A.B., Borchert S.,
RA Borriss R., Boursier L., Brans A., Brignell S.C., Bron S.,
RA Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M.,
Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Chim S.Y., Glaser P., Goffeau A., Golightly E.J., Emmerson P.T.,
RA Entian K.D., Errington J., Fabret C., Ferrari E., Foulger D.,
RA Ghim S.Y., Glaser P., Goffeau A., Golightly E.J., Galleron N.,
RA Ghim S.Y., Glaser P., Goffeau A., Golightly E.J., Galleron N.,
RA Ghim S.Y., Glaser P., Koningstein G., Krogh S., Kumano M.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Kobayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Medina N., Mellado R.P., Mizuno M., Moesti D., Nakai S., Noback M.,
RA Parro V., Pohl T.M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
RA Parro V., Pohl T.M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
RA Parro V., Pohl T.M., Portetelle D., Porwollik S., Ferscott A.M.,
RA Parro V., Pohl T.M., Schleich S., Schroeter R., Scoffene F.,
RA Sato T., Scanlan E., Schleich S., Schroeter R., Scoffene F.,
RA Sato T., Scanlan E., Takagi T., Takahashi H., Takemaru K.,
RA Takeuchi M., Tarconi E., Tanaka T., Terpstra P., Tognoni A.,
RA Yasamoto H., Yamanoto H., Vannane K., Vasumoto K., Yata K.,
RA Yoshida K., Yoshikawa H.F., Zumstein E., Yoshikawa H., Danchin A.,
The complete genome sequence of the Gram-positive bacterium Bacillus
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Best Local
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InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
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EMBL; Z99123; CAB15824.1;
PIR; S39711, S39711.
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-!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
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                                                                                                                                     SIIAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAF---FPFGNPIHNNTMIM 175
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                                                                                                                                                                                                                                                                                                             VSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIKILA 64
RRFLHDEIGYFDADVHNYW--DWDFYLRAAKDYRVKRVPCASVIYAFSDAGDNQSADLGA 213
                                                                                                                                                                                 LEKNSGHVAARNAGVKE-----ASGDCIMLCDDDDFFTPGHIEKMAKEIETADFVHSDA 113
                                                                                                                                                                                                                           QAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEME-----KDR 118
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23.9%;
                                                                                                                                                                                                                                                                                                                                                                 42;
                                                                                                                                                                                                                                                                                                                                                                                 Score 144.5; DB 1;
Pred. No. 9.6e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                     DD8428F7016EC9B3 CRC64;
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                                            218
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RESULT 13
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                                                                                                                                                                                                                                                       RA Kunst F. Ogasawara N. Moszer I., Albertini A.M., Alloni G.,
RA Azevedo V., Bertero M.G., Bessieres P., Bolotin A.M., Borchert S.,
RA Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.,
RA Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Choi S.K., Codani J.J., Fabret C., Ferrari E., Foulger D.,
RA Choi S.K., Codani J.J., Haga K., Haiech J., Harwood C.R., Henaut A.,
RA Fritz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Galleron N.,
RA Guiseppi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A.,
RA Guiseppi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Klein C.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Mauel C., Medigue C.,
RA Kurita K., Lapidus A., Lardinois S., Mauel C., Medigue C.,
RA Moone D., O'Reilly M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
RA Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M.,
RA Parro V., Pohl T.M., Portetelle B., Rappoort G., Rey M., Reynolds S.,
RA Rieger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,
RA Sato T., Scanlan E., Schleich S., Schroeter R., Scoffone F.,
RA Sato T., Schowska A., Seror S.J., Serror P., Shin B.S., Soldo B.,
RA Schyuchi J., Sekowska A., Seror S.J., Serror P., Shin B.S., Soldo B.,
RA Schyuchi M., Tanakoshi A., Tanaka T., Terpstra P., Takamaru K.,
RA Yoshida K., Valama S., Vandenbol M., Vannier F., Vasamorti A.,
RA Yoshida K., Yata K.,
Taka K., Yata K.,

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P39621;
01-FEB-1995
01-FEB-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE-95020537; PubMed-7934828; Glaser P., Kunst F., Arnaud M., Coudart M.P., Gonz Hullo M.F., Ionescu M., Lubochinsky B., Marcelino Presecan E., Santana M., Schneider E., Schweizer J. Rapoport G., Danchin A.;
                                      Charnock S.J., Davies G.J.;
"Structure of the nucleotide-diphospho-sugar transferase, SpsA from Bacillus subtilis, in native and nucleotide-complexed forms.";
Biochemistry 38:380-6385(1999).
-i- FUNCTION: GLYCOSYLTRANSFERASE IMPLICATED IN THE SYNTHESIS OF THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Spore coat polysaccharide biosynthesis protein SPSA OR IPA-63D.
                                                                                                                                                                                                                                           "The complete subtilis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Bacillus subtilis genome project: cloning and sequencing of the kb region from 325 degrees to 333 degrees."; mol. Microbiol. 10:371-384(1993).
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                                                                                                                                                       MEDLINE=99280694; PubMed=10350455;
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                        SPORE COAT.
                                                                                                                                                                                                                         390:249-256(1997).
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polysaccharide
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RESULT 14
YCDQ_ECOLI
ID YCDQ_ECOLI
AC P75905;
DT 01-NOV-1997
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Best Local S
Matches 62
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PDB; 1QG0; 04-MAY-00.
PDB; 1QG5; 04-MAY-00.
SubtiList; BG10609; spsA.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Transferase; Glycosyltransferase; 3D-structure; Complete proteome.
DISULFID 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This
                                                                   SEQUENCE FROM N.A.
STRAIN-87426617; PubMed-9278503;
MEDLINE-97426617; PubMed-9278503;
Blattner F.R., Plunkett G. III, Bloch C.A
Riley M., Collado-Vides J., Glasner J.D.,
Gregor J., Davis N.W., Kirkpatrick H.A.,
Mau B., Shao Y.;
                                                                                                                                                                                                                                                   Hypothetical protein YCDQ OR B1022.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                    Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                 01-NOV-1997
16-OCT-2001
            SEQUENCE FROM N.A
                                                                                                                                                                                                        Escherichia
                                         Science
                                                                                                                                                                                         NCBI_TaxID=562;
                                                                                                                                                                                                                                    Escherichia coli.
                                        "The complete genome sequence of Escherichia coli K-12."; Science 277:1453-1474(1997).
                                                                                                                                                                                                                                                                                                                                                                                                                    213
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                                                                                                                                                                                                                                                                                                                                                                                                                 LNYITDQ-----SIHFQLFELEKNEFVRNL
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(Rel. 35, Last sequence up
(Rel. 40, Last annotation
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Pred. No. 0.00012;
6; Mismatches 87
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r J.D., Rode C.,
a., Goeden V
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on update)
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                                                                                                               Perna N.T., Burland V.,
                                                                                                                                                                                                                      Enterobacteriaceae;
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                                                                                   C.K., Mayhew
n M.A., Rose I
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RESULT 15
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"A 718-kb DNA sequence of the Escherichia coli K-12 corresponding to the 12.7-28.0 min region on the lin DNA Res. 3:137-155(1996).

-i- SUBCELLULAR LOCATION: Integral membrane protein
-i- SIMILARITY: TO Y.PESTIS HMS LOCUS PROTEIN HMSR A
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Pfam; pP00535; Glycos_transf_2; 1.

Hypothetical protein; Transmembrane; Cor
TRANSMEM 5 25

TRANSMEM 33 53

POTENTIAL.

TRANSMEM 33 53
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Oshima T., Aiba H., Baba T., Fujita K., Hayashi K., Honjo A.,
Oshima T., Aiba H., Baba T., Fujita K., Kanai K., Kashimoto K.,
Ikemoto K., Inada T., Itoh T., Kajihara M., Kanai K., Mizobuchi K.,
Kimura S., Kitagawa M., Makino K., Masuda S., Miki T., Mizobuchi K.,
Mori H., Motomura K., Nakamura Y., Nashimoto H., Nishio Y., Saito N.,
Sampei G., Seki Y., Tagami H., Takemoto K., Wada C., Yamamoto Y.,
Yano M., Horiuchi T.;
SEQUENCE FROM N.A. STRAIN=ATCC 29342 MEDLINE=97105885;
                                                                                                                                                                                                                                                                                                                                   Y060_MYCPN
P75042;
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                                                                                                                              Mycoplasma pneumoniae. Bacteria; Firmicutes;
                                                                                                                                                                             MPN075
                                                                                                                                                                                                          Putative gly (D09_orf299)
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                                                                                                      NCBI_TaxID=2104;
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Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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Nucleic Acids Res. 24:4420-4449(1996).
-i- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
STRONG, TO M.GENITALIUM MG060.
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Q1-NOV-1996 (TrEMBLrel. 01,
Q1-JUN-2001 (TrEMBLrel. 17,
                                                                                                                                                                                           "Genetic locus for the biosynthesis of the variable portion Neisseria gonorrhoeae lipooligosaccharide.";
J. Exp. Med. 180:2181-2190(1994).
EMBL; U14554; AAA68009.1; -.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
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Q9RGN2;
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Q1-MAY-2000 (TrEMBLrel. 13, I
Q1-DEC-2001 (TrEMBLrel. 19, I
Glycosyltransferase.
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Harvey H.A., Porat N., Campbell C.A., Jennings M.,
Phillips N.J., Apicella M.A., Balke M.S.;
"Gonococcal lipooligosaccharide is a ligand for the
receptor on human sperm.";
Mol. Microbiol. 36:1059-1070(2000).
EMBL; AFI21135; AAFI4359.1; -.
Interpro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
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343; Conserv
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Q93PS0;
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Q1-DEC-2001 (TremBirel. 19, C)
O1-DEC-2001 (TremBirel. 20, L)
O1-MAR-2002 (TremBirel. 20, L)
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                                                                                                                                    Neisseria gonorrhoeae.
Bacteria; Proteobacter
NCBI_TaxID=485;
  gonorrhoeae
                          STRAIN=PID2;
Tong Y., Arking D.,
"Characterization o
                                                                                                                                                                                                                  Glycosyl transferase LGTA.
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SEQUENCE 362 AA;
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InterPro; IPR001173; Glycos_transf_2
Pfam; PF00535; Glycos_transf_2; 1.
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EMBL; U15992; AAA92074.1; -.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Danaher R.J., Levin J.C.,
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Nature 404:502-506(2000).
EMBL; AL162753; CAB83816.1;
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Pfam; PF00535; Glycos_transf_2; 1.
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SEQUENCE
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Lacto-N-neotetraose biosynthesis glycosyl tranferase.
LGTA OR NMA0524.
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                                                                                                                                                                                                                                                                                                                                     Parkhill J., Achtman M., James K.D., Bentley S.D., Churcher C., Klee S.R., Morelli G., Basham D., Brown D., Chillingworth T., Bavies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroyd Jagels K., Leather S., Moule S., Mungall K., Quail M.A., Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J., Whitehead S., Spratt B.G., Barrell B.G.; "Complete DNA sequence of a serogroup A strain of Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=22491 / SEROGROUP
MEDLINE=20222556; PubMed
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
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Bacteria; Proteobacteria; beta subdivision;
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01-OCT-2000
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MQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI
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346 AA;
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Pred. No. 3e-1
5; Mismatches
                                                                          Score 1712; DB 16;
Pred. No. 5.3e-139;
0; Mismatches 8;
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Best Local
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01-OCT-2000
01-OCT-2000
01-JUN-2001
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EMBL; AF208058; AAF25876.1; -.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
SEQUENCE 322 AA; 37109 MW; 88FECA
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Balthazar J.T
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Bacteria; Proteobacteria;
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                               TKAAAYELPEKDLPEEDFERARRELYQCFKRTDTPPSGAWLDFAADGRMRRLFTLRQYFG
                                                                        GRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLEYRQ
                                                                                                       GAIWDKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGGLRYDTGRDWAEDYQFWYDVSKL
                                                                                                                   GKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGGLRYDTERDWAEDYQFWYDVSKL
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 ILYRLIKNRRQARSDSAGKEQEI
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nilarity 97.8%;
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3; Mismatches
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Last sequence update)
Last annotation updat
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2.3e-134;
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Matches 315
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Q9L8E9;
01-OCT-2000
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Q9JXQ6;
Q1-OCT-2000
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InterPro; IPR0011173; G1ycos_transf_2.
Pfam; PF00535; G1ycos_transf_2; 1.
SEQUENCE 321 AA; 37052 MW; 6ACADA9A3CB738FA CRC64;
    Tettelin
                       SEQUENCE FROM N.A.
STRAIN=MC58 / SEROGROUP B;
MEDLINE=20175755; PubMed=1
                                                                                                                                          Neisseria meningitidis
Bacteria; Proteobacteri
                                                                                                                                                                                                    01-OCT-2000 (TrEMBLrel. 15, Created)
01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
Lacto-N-neotetraose biosynthesis glycosyl transferase
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Bacteria; Proteobacteria;
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01-JUN-2001
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Proteobacteria; beta subdivision;
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PubMed=10710307;
ders N.J., Heidelberg
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Pred. No. 8.4e-134;
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01-NOV-1996 (TREMBLEGL. 0
01-NOV-1996 (TREMBLEGL. 0
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                       MEDLINE-96414473; PubMed=8817494;
Jennings M.P., Hood D., Peak I.R.A., Virji M., Moxon E.R.;
Molecular analysis of a locus for the biosynthesis and phase-variable expression of the lacto-N-neotetraose terminal lipopolysaccharide structure in Neisseria meningitidis.";
Mol. Microbiol. 18:729-740(1995).
EMBL; U25839; AAC44084.1; -.
EMBL; U25839; AAC44084.1; -.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
SEQUENCE 333 AA; 38563 MW; 49D8F6CE375387BF CRC64;
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Pfam; PF00535; Glycos_transf_2; 1.
Transferase; Complete proteome.
SEQUENCE 349 AA; 40618 MW; 4B9E24
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EMBL; AE002541; AAF42258.1;
TIGR; NMB1929; -
                                                                                                                                                                        STRAIN-MC58
                                                                                                                                                                                      SEQUENCE FROM N.A.
                                                                                                                                                                                                                              Neisseria meningitidis.
Bacteria; Proteobacteria;
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Arking D., Tong Y., Stein D.C.;
"Analysis of lipooligosaccharide biosynthesis
J. Bacteriol. 183:934-941(2001).
EMBL; AF240672; AAG09764.1; -.
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InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
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Pred. No. 3.9e-130;
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Q50949;
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EMBL; AF355193; AAL12840.1; -.
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Bacteria; Proteobacteria;
Bacteria; Proteobacteria;
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Neisseria gonorrhoeae lipooligosaccharide J. Exp. Med. 180:2181-2190(1994).
                                 Gotschlich E.C.;
"Genetic locus for the biosynthesis of the
                                                                                                                                                                               Neisseria gonorrhoeae.
Bacteria; Proteobacteria;
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Q9CLR9;
01-JUN-2001
                                                                                                                                                                                                                                                                                   May B.J., Zhang Q., Li L.L., Paustian M.L., Whittam T. "Complete genomic sequence of Pasteurella multocida Pm Proc. Natl. Acad. Sci. U.S.A. 98:3460-3465(2001).

EMBL; AE006155; AAK03224.1; -..
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2.
Hypothetical protein; Complete proteome.

SEQUENCE 337 AA; 39267 MW; 8639BCFB5F700DB4 CRC64;
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                                                                                                                      QPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRIK 61
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IINNEENKGFIASLNIGIASI-----NGDYLARTDADDITKPEWIEKILGYMLSHPQII
                                   ILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSII 121
                                                                                          QPLVSVLICAYNADKYIEECIDAILNQTYKNLEIVVVNDGSTDTTLSKLHYFAGKDPRIK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY
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                                                                                                                                                                                             145;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (TTEMBLrel. 17, Created)
(TTEMBLrel. 17, Last sequence update)
(TTEMBLrel. 19, Last annotation update)
1 protein PM1140.
                                                                                                                                                                                          Conservative
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                                                                                                                                                                                          59;
                                                                                                                                                                                     Score 666.5; DB 1
Pred. No. 4.5e-49;
9; Mismatches 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 1049; DB 2;
Pred. No. 5.6e-82;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
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                                                                                                                                                                                                                                          DB 16;
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RESULT
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01-FEB-1997 (TrEMBLrel. 02, C. 01-MAY-1999 (TrEMBLrel. 10, L. 01-JUN-2002 (TrEMBLrel. 21, L. 0RF139-19 protein (Putative g Vibrio cholerae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  J. Clin. Microbiol. 34:2904-2908(1996).
EMBL; AB012956; BAA33603.1; -.
EMBL; U72485; AC44837.1; -.
HSSP; P39621; 1060.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Transferase.
SEQUENCE 337 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-MO45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bacteria; Proteobacteria; gamma subdivision; Vibrionaceae;
NCBI_TaxID=666;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Submitted (APR-1998) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Yamasaki S., Shimizu T., Hoshino K.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "Cloning and sequence of a region of Vibrio its use in PCR-based detection.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Weintraub
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDLINE=97094999; PubMed=8940420;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE OF 157-337 FROM N.A.
                                                                                                                                                                            117
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                                                                                                                                                                                                                                                                                                  LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122
                                                                                                                                                                                                                                                                                                                                                                           PKISVVMSVYNGEKYLGEAIDSILKQTESDFEFIIINDGSTDKTLEIIKSYMKKDDRI-V
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                         QGIQ.
                                                                          YKINYDLGYKDAEDYKFWVDFSKYTLFSNVPEILLRYRYHQESISRVADNKENKERFEII
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                                                                                                                      -GLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVS----SKHSVRQHEIA
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                         KTARNDFLQSMGFK----
-NIKSKKWKMPTQDPDLKAKLTFSVPFAHPTVMIRKKVIDK
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Last annotation update)
glycosyltransferase A).
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Pred. No. 3.2e-27;
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                                                                                                                                                                                                                                                                           -GQYIARMDADDISIKSRFEKQIEFLDSNPDIGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches 113;
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RESULT 15
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OS Vibri
OC NGBI
COC NGBI
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Search completed: December Job time: 31.8926 secs
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                                                                                                                                                                                                                                                                                                                                                                                                         Query Match 22.5%; Score 410; DB 2; Length 337; Best Local Similarity 37.9%; Pred. No. 5.3e-27; Matches 97; Conservative 45; Mismatches 88; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Stroeher U.H., Parasivam G., Dredge B.K., Mann

"Novel Vibrio cholerae 0139 genes involved in

biosynthesis.";

J. Bacteriol. 179:2740-2747(1997).

EMBL; Y07786; CAA69119.1; -.

HSSP; P39621; 10GQ,

InterPro; IPR001173; Glycos_transf_2.

Pfam; PF00535; Glycos_transf_2; 1.
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O34234;
O1-JAN-1998 (TrEMBLrel. 05, Created)
O1-JAN-1998 (TrEMBLrel. 05, Last sequence update)
O1-JUN-2002 (TrEMBLrel. 21, Last annotation update)
Sugar transferase.
Vibrio cholerae.
Bacteria; Proteobacteria; gamma subdivision; Vibrionaceae; Vibrio.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
STRAIN-AI-1837;
MEDLINE-97252505; Pubmed-9098074;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Transferase.
SEQUENCE 337 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=666;
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                                                                                                    238 QGIQKTARNDFLQSMG 253
                                                                                                                                     167
                                                                                                                                                                       183
                                                                                                                                                                                                       117
                                                                                                                                                                                                                        123 MGAWLEYLSEEKDGNRLARHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDG 182
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                                                                                                                                                                                                                                                                                                                                      LAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 122
                                                                  SKIQ----NEVLTSVG
                                                                                                                                     YKINYDLGYKDAEDYKFWVDFSKYTLFSNVPEILLRYRYHQESISRVADNKENKERFEII 226
                                                                                                                                                         -GLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVS----SKHSVRQHEIA 237
                                                                                                                                                                                                     CGTWVEVFGE-----NIKSKKWKMPTQDPDLKAKLTFSVPFAHPTVMIRKKVIDK 166
                                                                                                                                                                                                                                                                        LVSRENKGLIVSLNEGLD-LAK-----GQYIARMDADDISIKSRFEKQIEFLDSNPDIGV 116
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                               39236 MW; 563D85188B135464 CRC64;
                                                                  238
                 2, 2002, 12:02:15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Manning P.A.;
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Gapop 10.0 , Gapext 0.5
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/SIDS2/gcgdata/geneseq/geneseqp-embl/AA1982.DAT: *
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Pred. No. 1s the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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SUMMARIES

N. gonorrhoeae gly National GLUT. Nei National GLUT. Hae Streptococcus pneu Neisseria meningit Streptococcus poly Neisseria meningit Neisseria meningit	AAR91313 AAW06578 AAB72456 AAB72456 AAB44566 AAB44538 AAU99917 AAB72455 AAV81561 AAW89327 AAW89327	17 18 22 21 21 23 23 23 23 23 23 23 23 23	306 306 306 302 302 302 302 303 334 106 399 401	100.0 100.0 35.2 34.5 34.3 19.9 16.9 114.1 12.4	1657 1657 1657 583 578 588 330 280 280 233 203.5	1 1 2 2 2 3 3 4 4 4 7 7 7 9 9 10 0 10 0 10 0 10 0 10 0 10 0
	;	1	Query	Query		vesurc

Nucleic acids encoding glycosyl transferase(s) - used in the diagnosis of infection with Neisseria and for the biosynthesis of oligo:saccharide(s)

WPI; 1996-200924/20. N-PSDB; AAT14061. Gotschlich EC;

	45	44	43	42	41	40	39	38	37	36	35	34	ω ω	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11
	156.5	156.5	156.5	157	157	157	157	157	157	157	162.5	165	165	165	169.5	171.5	171.5	171.5	175.5	176.5	176.5	178.5	184	184	184	184	186	190.5	190.5	190.5	196	197	197	197.5	197.5
	9.4	9.4	9.4	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.8	10.0	10.0	10.0	10.2	10.4	10.4	10.4	10.6	10.7	10.7	10.8	11.1	11.1	11.1	11.1	11.2	•	•		•	•	•	11.9	
	365	345	282	390	390	384	372	372	361	305	341	365	364	323	351	361	357	357	413	674	674	401	441	409	392	272	361	346	346	332	312	398	313	346	332
	21	21	21	23	21	21	22	19	21	21	23	21	21	21	23	21	23	21	23	23	19	23	21	21	21	23	23	23	21	21	23	23	21	21	21
•	AAG13968	AAG13969	AAG13970	ABB91529	AAG30295	AAG30296	AAB60318	AAW98360	AAG30297	AAG55049	ABB92615	AAG10401	AAG10402	AAG10403	ABB92218	AAG13327	ABB92767	AAG13328	ABP27412	ABP54656	AAW61238	ABP27413	AAG28025	AAG28026	AAG28027	ABP27661	ABB90816	ABB92808	AAG45490	AAG45491	ABP27411	ABP28550	AAY91285	157	AAG15767
		Arabidopsis thalia		1		abidopsis thal	icobactes	GHPO 1		is	Herbicidally activ	Arabidopsis thalia	Arabidopsis thalia	Arabidopsis thalia	Herbicidally activ	Arabidopsis thalia	Herbicidally activ	Arabidopsis thalia	Streptococcus poly	S. pneumoniae SP11	Streptococcus pneu	~		is	Arabidopsis thalia	Streptococcus poly	Herbicidally activ		Arabidopsis thalia	Arabidopsis thalia	Streptococcus poly	coccı	treptoc	is thali	Arabidopsis thalia

ALIGNMENTS

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RESULT 1
AAR91313
ID AAR9
                                                      Glycosyltransferase; lipo-oligosaccharide; vaccine.
                                                                                                                                                                                                                          AAR91313 standard; Protein; 306 AA
                                                                04-APR-1996.
                                                                                                       Neisseria gonorrhoeae strain F62.
                                                                                                                                                           N. gonorrhoeae glycosyltransferase LgtC
                                                                                                                                                                                  09-JUL-1996
                                                                                                                                                                                                        AAR91313;
(UYRQ ) UNIV ROCKEFELLER.
                     26-SEP-1994;
                                          25-SEP-1995;
                                                                                     WO9610086-A1.
                                                                                                                                                                                 (first entry)
                     94US-0312387
                                         95WO-US12317.
                                                                                                                                       lgt gene; LOS locus;
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RESULT 2
AAW06578
ID AAWC
Qy
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Best Local S
Matches 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 igtC (AAR91313) can be obtd. by expression of the ligtC coding sequence in recombinant host cells. A method for adding Gal alphal-4 to Gal comprises contacting a reaction mixture contg. activated Gal to an acceptor molety comprising a Gal residue in the presence of LigtC. Oligosaccharides can be produced that, when attached to non-toxic liptds, are useful for Neisseria vaccine prepn. Blood group core oligosaccharides, and minics of lacto-N-neotetraose, gangliosides and saccharide portions of globoglycolipids can also be
          Buczala
                                                                                                                                                          Neisseria
                                                                                                                                                                                   N-acetylgalactosaminyl transferase;
                                   (NEOS-) NEOSE TECHNOLOGIES INC.
                                                           07-JUN-1995;
                                                                                 03-JUN-1996;
                                                                                                          19-DEC-1996
                                                                                                                                                                                              Polyglycosyltransferase; N-acetylglucosaminyl transferase;
                                                                                                                                                                                                                      Lipo-oligosaccharide gene-encoded protein
                                                                                                                                                                                                                                                21-MAR-1997
                                                                                                                                                                                                                                                                            AAW06578;
                                                                                                                                                                                                                                                                                                AAW06578 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          produced using the enzymes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 10;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5 Glycosyltransferases (AAR91311-15) are products of the lgt locus (AAT14061) of Neiserria gonorrhoeae strain F62. Glycosyltransferase
                                                                                                                                                                                                                                                                                                                                                               301
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                                                                                                                                                                                                                                                                                                                                                                                                                           VSHYCGSAKPWHRDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCMLQRWRKKLSAR 300
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMPVA 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYK 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLG 120
                                                                                                                                                                                                                                                                                                                                                                FLRKIY 306
                                                                                                                                                                                                                                                                                                                                                                                                              VSHYCGSAKPWHRDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCMLQRWRKKLSAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                             DVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMPVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              GNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 306;
          SL,
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                                                                                                                                                          gonorrhoeae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   306 AA;
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                                                                                                                                                                                                                                                (first entry)
         Johnson KF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2d; 81pp;
                                                          95US-0478140
                                                                                 96WO-US08323
                                                                                                                                                                                                                                                                                                  Protein;
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                                                                                                                                                            ATCC 33084
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          Roth S;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 0;
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                                                                                                                                                                                  lipo-oligosaccharide
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RESULT 3
AAB72456
ID 72456
ID 80-M
XX AAB7
XX AB7
XX OS Part
XX UGGT
XX UGGT
XX WO2C
XX WO2C
XX PD 22-E
XX 18-4
PF 27-J
XX 18-4
PA (CAF
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              A lipooligosaccharide-encoding gene region (AAT49230) of Neisseria gonorrhoeae ATCC 33084 includes coding sequences for 5 proteins (AAW06576-80), one of which (AAW06576) is a polyglycosyltransferase that catalyses the addition of GlcNAc and GalNAc disaccharides to a paradactose moiety. The function of the other 4 proteins is not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Transfer of at least 2 saccharide units using poly:glycosyl:transferase - isolated from N. gonorrhoeae, catalyses the addition of both GlcNac and GalNac di:saccharide(s) units to a
                                                                                                                                                        Neisseria gonorrheae
                                                                                                                                                                                                                                    08-MAY-2001
                                                                                                                                                                                                                                                               AAB72456;
                                                                                                                                                                                                                                                                                         AAB72456 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   stated in the specification.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Disclosure; Fig 2C-E; 38pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1997-052351/05.
N-PSDB; AAT49230.
                                                                             27-JUL-2000;
                                                                                                                                                                                UGGT; UDP-glucose:glycoprotein glucosyltransferase; enzyme; GLYT
                                                                                                                                                                                                           Partial GLYT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     single galactose moiety
                         (CANA ) NAT RES COUNCIL CANADA.
                                                     18-AUG-1999;
                                                                                                                               WO200112845-A1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VSHYCGSAKPWHRDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCMLQRWRKKLSAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYK
                                                                                                                                                                                                                                                                                                                                                       FLRKIY 306
                                                                                                                                                                                                                                                                                                                                                                                 FLRKIY 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          DVMQYQDQDILNGLEKGGVCYANSRENEMPTNYAFMANGFASRHTDPLYLDRTNTAMPVA 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GNWVGACIDLEVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYK
                                                                                                                                                                                                                                                                                                                                                                                                           VSHYCGSAKPWHRDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCMLQRWRKKLSAR
                                                                                                                                                                                                                                                                                                                                                                                                                                                             DVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMPVA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKYLYLDTDVLVRDGLKPLWDTDLG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        306;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            306 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                                                                                    (first entry)
                                                                             2000WO-CA00883
                                                   99US-0376330.
                                                                                                                                                                                                                                                                                        Protein;
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                                                                                                                                                                                                                                                                                          106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 1657; DB 18;
Pred. No. 4.8e-169;
); Mismatches 0;
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Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             test sample on UDP-glucose:glycoprotein glucosyltransferase (UGGT) activity. The method comprises exposing an acceptor substrate for UGGT to a labelled donor in the presence of the test sample and UGGT. The method is useful for determining UGGT activity. In particular, the method is useful in glucosyltransferase assay and kinetics measurement for determining UGGT activity. UGGT is a soluble enzyme of the endoplasmic reticulum which catalyses the addition of a glucose residue onto asparagine-linked oligosaccharides, which are present on incorrectly folded glycoproteins. The present sequence was used in a sequence homology comparison with rat UGGT (see AAF60732 and AAB72436) which was
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         WPI;
                      Attenuated Pasteurellaceae bacteria comprising mutations in virulence genes, useful as a live attenuated vaccine against bacterial infections
                                                                  N-PSDB;
                                                                               WPI; 2000-647422/62
                                                                                                                                                                        09-APR-1999;
                                                                                                                                                                                                   06-APR-2000; 2000WO-US09218
                                                                                                                                                                                                                              19-OCT-2000
                                                                                                                                                                                                                                                     WO200061724-A2
                                                                                                                                                                                                                                                                                Pasteurella multocida
                                                                                                                                                                                                                                                                                                         Virulence gene; antibacterial; vaccine; septicemia; bronchopneumonia; rhinitis;
                                                                                                                                                                                                                                                                                                                                                Virulence gene protein #46.
                                                                                                                                                                                                                                                                                                                                                                            08-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                               AAB44566 standard; Protein; 302 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Disclosure; Fig 10; 95pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Determining the effect of a test sample on UDP-glucose:glycoprotein glucosyltransferase (UGGT), useful for measuring UGGT activity, comprises exposing an acceptor substrate for UGGT to a labeled donor in
                                                                                                        Lowery DE, Fuller TE,
                                                                                                                                                             10-SEP-1999;
                                                                                                                                 (PHAA ) PHARMACIA & UPJOHN INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                presence of UGGT -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2001-218358/22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    the method of the present
                                                                  AAC79641.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           106 AA;
                                                                                                                                                                                                                                                                                                       bronchopneumonia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   invention relates to a method for determining
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                          99US-0128689.
99US-0153453.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  35.2%;
                                                                                                        Kennedy MJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 583; DB 22; pred. No. 1.9e-54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     invention.
                                                                                                                                                                                                                                                                                                         wound infection.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      0;
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RESULT 5
AAB44538
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Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The family Pasteurellaceae encompasses several pathogens that infect a wide variety of animals. The present invention relates to virulence genes from Pasteurellaceae. The present sequence is a protein encoded by one such virulence gene. The virulence genes of the present invention may be mutated in order to produce an inactive gene. The inactive virulence gene may in turn be used to produce a vaccine, which is useful for treating bacterial infections such as septicemias, bronchopneumonias, rhinitis and
          WPI; 2000-647422/62
N-PSDB; AAC79598.
                                                                                                          09-APR-1999;
10-SEP-1999;
                                                                                                                                                                                                                                                               Virulence gene; antibacterial; septicemia; bronchopneumonia; r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Claim 39; Pages 260-261; 322pp;
                                                   Lowery DE,
                                                                                                                                                  06-APR-2000;
                                                                                                                                                                               19-OCT-2000
                                                                                                                                                                                                         WO200061724-A2
                                                                                                                                                                                                                                      Pasteurella multocida.
                                                                                                                                                                                                                                                                                                      Virulence gene protein #18
                                                                                                                                                                                                                                                                                                                                  08-FEB-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                           AAB44538 standard; Protein; 302 AA
                                                                              (PHAA ) PHARMACIA & UPJOHN INC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KLSARFLRKIY 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MYPNQMIYQDQDILNILFRNKVCYLDCRFNFMPNQLERIKQYHKGKLSNLHSLEK--TTM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VNNFLTAACYDSFIENEKSEHKKSISMSDKEYYFNAGVMLFNLDEWRKMDVFSRALDLLA 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LGGNWVGACIDLEVERQEG-YKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVE 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        FIDVNPEDFAGFPLNIRHISITTYARLKLGEYIAD-CDKVLYLDTDVLVRDGLKPLWDTD 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MNILFVSDDVYAKHLVVAIKSI-INHNEKGISFYIFDLGIKDENKRNINDIVSSYGSEVN 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                RIRYKFKYQVY 302
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PVVISHYCGPEKAWHADCKHFNVYFYQKILAEIT-----RGTDKERVLSIKTYLKALIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PVAVSHYCGSAKPWHRDCTVWGAERFTELAGSLTTVPEEWRG--KLAVPPTKCMLQRWRK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FIAVNEKEFESFPVQISYISLATYARLKAAEYLPDNLNKIIYLDVDVLVFNSLEMLWNVD 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         infections.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             302 AA;
                                                   Fuller TE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                   2000WO-US09218
                                                                                                          99US-0128689
99US-0153453
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    34.5%;
                                                    Kennedy MJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 572; DB 21; Pred. No. 1.4e-52;
                                                                                                                                                                                                                                                                rhinitis;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  English
                                                                                                                                                                                                                                                                wound infection
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       115;
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                                                                                                                                                                                                                                                                              infection;
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RESULT 6
AAU99917
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Best Local
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14-NOV-2000; 2000US-248331P
14-NOV-2000; 2000US-248362P
14-NOV-2000; 2000US-248365P
                                                                                                                                                                                      67210; glucosyl transferase; infection; haematopoeitic disorder; blood clotting disorder; cancer; autoimmune disorder; leukaemia; immunological disorder; cardiovascular disorder; neurological disorder; cellular proliferation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               from Pasteurellaceae. The present sequence is a protein encoded by one such virulence gene. The virulence genes of the present invention may be mutated in order to produce an inactive gene. The inactive virulence gene may in turn be used to produce a vaccine, which is useful for treating bacterial infections such as septicemias, bronchopneumonias, rhinitis and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Attenuated Pasteurellaceae bacteria comprising mutations in virulence genes, useful as a live attenuated vaccine against bacterial infections
                                                                                                                                                                                                                                                                  Human 67210
                                                                                                                                                                                                                                                                                                 07-OCT-2002
                                                                                                                                                                                                                                                                                                                                                         AAU99917 standard;
                                                                                                                   WO200240656-A2
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                                                         14-NOV-2001; 2001WO-US45291
                                                                                      23-MAY-2002
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         family Pasteurellaceae encompasses several pathogens that infect a evariety of animals. The present invention relates to virulence genes
                                                                                                                                                                             plood
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             KLSARFLRKIY 306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MYPNQMIYQDQDILNILFRNKVCYLDCRFNFMPNQLERIXQYHKGKXSNLHSLEK--TTM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          VNNFLTAACYDSFIENEKSEHKKSISMSDKEYYFNAGVMLFNLDEWRKMDVFSRALDLLA 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MNILEVSDDVYAKHLVVAIKSI · INHNEKGISFYIFDLGIKDENKRNINDIVSSYGSEVN
                                                                                                                                                                                                                                                                                                                                                                                                                                  RIRYKFKYQVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PVVISHYCGPEKAWHADCKHFNVYFYQKILAXXS-----RGXDKERVLSIKTYLKALIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PVAVSHYCGSAKPWHRDCTVWGAERFTELAGSLTTVPEEWRG--KLAVPPTKCMLQRWRK 295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      infections.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Similarity
                                                                                                                                                                             cell disorder; viral disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           302 AA;
                                                                                                                                                                                                                                                                  glycosyl transferase domain
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                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                  302
                                                                                                                                                                                                                                                                                                                                                           Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               34.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 568; DB 21;
Pred. No. 3.7e-52;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Mismatches 116;
                                                                                                                                                                             neurological disorder
                                                                                                                                                                                                                                                                  consensus sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 302;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CC an inability to clear infections (e.g., viral or bacterial infections),
CC as well as disorders related to abnormal cellular proliferation or
CC differentiation, e.g., leukaemia. They may also be used to control
CC disorders of metabolic imbalance (e.g., disorders of lipopolysaccharide
CC blosynthesis or glycogen synthesis) immunological disorders,
CC cardiovascular disorders, neurological disorders, or cellular
CC proliferation and/or differentiation disorders, or cellular
CC proliferation and/or disorders differentiative disorders, red blood
CC cell disorders, viral diseases, neurological disorders (e.g., brain
CC disorders, path or metabolic disorders and disorders associated with
CC disorders, disorders of the small intestine, disorders associated with
CC metabolism. The sequences of the invention are also useful for
CC screening assays, monitoring clinical trials, and pharmacogenetics);
CC and metabols of treatment (e.g., therapeutic and prophylactic). The
CC present sequence represents a predicted consensus sequence motif
CC found in the protein of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local
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30-NOV-2000;
30-NOV-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This invention relates to the DNA and protein sequences of novel isolated 47476, 67210, 49875, 48642, 33201, 83378, 84233, 64708, 85041 or 84234 proteins. The method of the invention is useful for treating a disorder characterised by aberrant activity of 47476, 67210, 49875, 46842, 33201, 83378, 84233, 64708, 85041 or 84234-expressing cell in a subject. The protein molecules can act as novel diagnostic targets and therapeutic agents for controlling aberrant or deficient signal transduction resulting, in e.g., haematopoeitic disorders, including blood clotting disorders, autoimmune disorders, or disorders related to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 or 84234 polypeptides, useful as reagents or targets for treating diagnosing pain or metabolic, liver, kidney, or cardiovascular disorders
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Disclosure; Fig 6; 298pp; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Isolated 47476, 67210,
253
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                                      SRFNFMPTNYAFMANGFASRHTDPLYLDRTN-TAMPVAVSHYCGS-AKPWHR
                                                                                                                                                                                                    DLGGNWV-GAC-----IDLFVERQEG----YKQKIGMADG----EYYFNAGVL 156
                                                                                                                                                                                                                                                                                                                                                                         DTEIRFHVLDAGISEENRAAVAANLRGGGN--------IRFIDVNPED--F 68
                                                                                                                   LINLKKWRRHDIFKMSCEWVEQYK--DVMQYQDQDILNGLFKG-----GVCYAN
                                                                                                                                                                                                                                                   ESLPLTANMKRRISKATYAREDIQVLLLADLLPDYSKKRVLYLDADVVVKGADLSELLDL
                                                                                                                                                                                                                                                                                          AGFPLNI---RHISITTYAR-----LKLGEYIADCDK--VLYLDTDVLVRDG-LKPLWDT 117
                                                                                                                                                                                                                                                                                                                                 EENVKFHILTDGFKEKSRLLVSQ-----GDNKKLLETLAPPEFQHFTAIRFYDINTSDELL
PRYNTQYSNVAYMYYFLKWRHKEKLAKKLLNPTKGNPSIVHYCGAGTKPWHK
                                                                                 LINLKKWREENLFKKALELLNEKKEEDVYFYPDQDVLNILFKGKFKSDEIDSIARVLFLP
                                                                                                                                                                DLGENKILGAVEDLVSNESKFFFVDFWQERAKSRLIEYEQFLYETDGLKVIGSYFNAGVL
                                                                                                                                                                                                                                                                                                                                                                                                                  102;
                                                                                                                                                                                                                                                                                                                                                                                                                                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   334 AA;
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; 2000US-250176P.
; 2000US-250327P.
                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                  33;
                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 330; DB 23; Pred. No. 1.5e-26;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    46842, 33201, 83378, 84233,
                                                                                                                                                                                                                                                                                                                                                                                                                  Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                  87;
                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 334;
                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                        253
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                                                                                                                                                                                                                                                                                                                                                                                                                  70;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                The present invention relates to a method for determining the effect of a test sample on UDP-glucose;glycoprotein glucosyltransferase (UGGT) activity. The method comprises exposing an acceptor substrate for UGGT to a labelled donor in the presence of the test sample and UGGT. The method is useful for determining UGGT activity. In particular, the method is useful in glucosyltransferase assay and kinetics measurement for determining UGGT activity. UGGT is a soluble enzyme of the endoplasmic reticulum which catalyses the addition of a glucose residue onto asparagine-linked oligosaccharides, which are present on incorrectly folded glycoproteins. The present sequence was used in a sequence homology comparison with rat UGGT (see AAF60732 and AAB72436) which was used in the method of the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Determining the effect of a test sample on UDP-glucose:glycoprotein glucosyltransferase (UGGT), useful for measuring UGGT activity, comprises exposing an acceptor substrate for UGGT to a labeled donor the presence of UGGT -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   WPI;
Streptococcus pneumoniae; vaccine; screening; protein antigen;
                                                             Streptococcus
                                                                                                                          24-MAY-2000
                                                                                                                                                                                                                                           AAY81561 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Disclosure;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Tessier
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22-FEB-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        UGGT; UDP-glucose:glycoprotein glucosyltransferase; enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Partial GLUT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   08-MAY-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (CANA )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  18-AUG-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                 151 FNAGVLLINLKKWRRHDIFKMSCEWVEQYKDVMQYQDQDILNGLFKG
                                                                                                                                                                                                                                                                                                                                                                                           60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              92 IADCDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVE-RQEGYKQKIGMADGEYY 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \vdash
                                                                                                                                                                                                                                                                                                                                                                                     FNAGILLINLNKWKEENIFQKSINWMNKYNNVMKYQDQDILNGICKG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2001-218358/22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          IKNIEKAIYIDVDTLTNSSLQELWNIDITNYYLAACRDTFIDVKNEAYKKTIGL-EGYSY 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Fig 10; 95pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Dignard
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                                                                                                                       (first entry)
                                                          pneumoniae type 4 protein sequence #61.
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                                                                                                                                                                                                                                           Protein;
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46.78;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              24;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 280; DB 22;
Pred. No. 6.3e-22;
4; Mismatches 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Thomas DY;
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Best Local
                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                          specifically claimed nucleotide sequences isolated from S. pneumoniae. The sequences have antibacterial and antiinflammatory properties. The protein sequences, and fragments of them, are useful as immunogens and/or antigens. The nucleotide sequences can be used in vaccines and in diagnostic assays. The proteins and nucleotides can be useful for the detection and diagnosis of S. pneumoniae. The protein sequences are also useful for screening an agent capable of antagonising, inhibiting or interfering with the function or expression of the proteins in which the agent is useful for treatment or prophylaxis of S. pneumoniae infection and meningitis. AAA05591 to AAA05614 represent primers used in the exemplification of the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      New Streptococcal protein, useful as a vaccine, for diagnosis pneumococcal diseases and for screening agents capable of antior inhibiting expression of the protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 2000-195300/17
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gilbert CFG,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27-JUL-1998;
19-MAR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     antibacterial; antiinflammatory; meningitis; infection; diagnosis;
pneumococcal disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAY81501
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 216
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                                                                                                                                                                                                                                                                                                          3 IVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEE-----NRAAVAANLRGGGN 57
                                                                                                                                                      DLGGNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVE 177
                                 PVAVSHYCGSAKPWHRDCTVWGAERFTEL 266
                                                                                                   QYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAM 237
PPTIVHYASHDKPWN----TYSISRLREL
                                                                   EQNQVVHLGDQSILNIYFEDNWLALDKTYNYMVGIDIYHLAQECERLDD.
                                                                                                                                     DLKGYSIGAVDDVYA--YEGRKSG-----FNTGMLLMDVAKWKEHSIVNSLLELAA 165
                                                                                                                                                                                                      IRSVHIDKELFESYKTG-PHINYASYFRFFATE-VVESDRVLYLDSDIIVTGELATLFEI 116
                                                                                                                                                                                                                                      IRFIDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDT 117
                                                                                                                                                                                                                                                                          IVLAADNAYLIPLETTIKSV--LYHNRDVDFYILNSDIAPEWFKLLGRKMEVVN----ST 58
                                                                                                                                                                                                                                                                                                                                                               Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  to AAY81679 represent specifically claimed protein sequences from Streptococcus pneumoniae. AAA05407 to AAA05590 represent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Page 78;
                                                                                                                                                                                                                                                                                                                                                                                                               399 AA;
                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    pneumoniae.
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99US-0125164.
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                                                                                                                                                                                                                                                                                                                                                             14.1%;
27.5%;
                                                                                                                                                                                                                                                                                                                                             42;
                                                                                                                                                                                                                                                                                                                                            Score 233; DB 21;
Pred. No. 5.2e-16;
2; Mismatches 115
 240
                                                                                                                                                                                                                                                                                                                                             115;
                                                                                                                                                                                                                                                                                                                                                                           Length 399;
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26-FEB-1999

(first entry)

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                                                                                                                                                                                                                                                                RESULT 10
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Best Local (
                                                                                                                                                                                                                                                                                                                                                                                 Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           host cell. The method comprises introducing into the host cell a nucleic acid encoding the glycosyltransferase and incubating the host cell under conditions appropriate for expression of the glycosyltransferase, where the host cell substantially lacks a protease that cleaves polypeptides between two consecutive positively charged amino acid residues. The glycosyltransferase can be used in in vitro production of oligosaccharide structures which are potential therapeutic agents for use in the manipulation of cell-cell recognition events, particularly adhesion of bacteria and viruses to mammalian cells and leukocyte-endothelial cell interaction through selectins in inflammation. The method provides more readily recoverable active glycosyltransferases than prior art methods involving mammalian glycosyltransferases. The present sequence represents a C-terminal peptide from Neisseria meningitidis lgtC from the present invention.
WO200234771-A2
                                Streptococcus agalactiae
                                                           Streptococcus; GAS; GBS; group B streptococcus; Streptococcus group A streptococcus; Streptococcus pyogenes; antibacterial; antiinflammatory; infection; vaccine; meningitis; gene therap
                                                                                                                                  Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Expressing high levels of glycosyltransferases - comprises use either host cells deficient in proteolytic enzymes or modified glycosyltransferase genes deleted in a proteolytic recognition
                                                                                                                                                                 02-JUL-2002
                                                                                                                                                                                                   ABP28548
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27-MAY-1997;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         glycosyltransferase; proteolytic enzyme.
                                                                                                                                                                                                                                ABP28548 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Example 1; Fig 8; 61pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26-MAY-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (CANA ) NAT RES COUNCIL CANADA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Neisseria
                                                                                                                                                                                                                                                                                                                            261 ERFTELAGSLTTVPEEWRGKLAVP----PTKCMLQRWRKKLSARFLRKIY 306
                                                                                                                                                                                                                                                                                                                                                                                                 Local Similarity
                                                                                                                                                                                                                                                                                                                  \vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1999-035177/03.
                                                                                                                                                                                                                                                                                                               ERFTELAGSLTTVPEEWRGKLAVPHRMFSTKRMLQRWRRKLSVRFLRKIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          has been developed of expressing a glycosyltransferase in a 1. The method comprises introducing into the host cell a nucleic oding the glycosyltransferase and incubating the host cell under
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ¥,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis; lgtC; lgtB; beta-1,4-galactosyltransferase,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            meningitidis
                                                                                                                                                                                                                                                                                                                                                                                                                                               50 AA;
                                                                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                               (first entry)
                                                                                                                                  polypeptide SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Young NM
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                                                                                                                                                                                                                                Protein;
                                                                                                                                                                                                                                                                                                                                                                                               12.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            lgtC C-terminal peptide.
                                                                                                                                                                                                                                  401
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                                                                                                                                                                                                                                                                                                                                                                                               Score 205; DB 20; Pred. No. 2.3e-14;
                                                                                                                                  ID NO 6272.
                                                                                                                                                                                                                                B
                                                                                                                                                                                                                                                                                                                                                                                 Mismatches
                                                                                            Streptococcus agalactiae;
                                                                                                                                                                                                                                                                                                                                                                                                             Length 50;
                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                              4.
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RESULT 11 AAG15767

AAG15767

standard;

Protein;

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             The invention relates to a protein (ABP25413-ABP30895) from group B CC streptcocccus/GBS (Streptcocccus agalactiae) or group A streptcoccus/GBS (Streptcocccus younges), comprising one of 5483 sequences ($1), given in the specification. The proteins have antibacterial and antiinflammatory cactivity. (I), nucleic acids encoding (I), ABN6604-ABN71526 and crivity. (I), nucleic acids encoding (I), ABN6604-ABN71526 and cativity. (I), nucleic acids encoding (I), ABN6604-ABN71526 and crivity are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by streptcocccus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptcocccus in a compound binds to biological sample. (I) is used to determine whether a compound binds to (I). A composition comprising (I) or a nucleic acid encoding (I), may be cused as a vaccine or diagnostic composition. The disease caused by Streptcocccus that is prevented or treated may be meningitis. Nucleic acid encoding (I) may be used to recombinantly produce (I) and may be used in gene therapy. Antibodies to (I) are used for affinity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
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Best Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 1; Page 3790-3791; 4525pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Telford J,
Tettelin H;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        02-MAY-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     chromatography, immunoassays, and distinguishing/identifying
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27-OCT-2000;
24-NOV-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    29-OCT-2001;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (GENO-)
216
                                                                                    237
                                                                                                                                                               163
                                                                                                                                                                                                                                                    179
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                                                                                                                                                                                                                YKDVMQYQDQDILNGLEKGGVCYANSRENEMPTNYAFMANGFASR--HTDPLYLDRTNTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2002-352536/38.
DB; ABN69179.
PNII--HFLTSDKPWNEN----SVARFREL
                                                                               MPVAVSHYCGSAKPWHRDCTVWGAERFTEL
                                                                                                                                                                                                                                                                                                                                        FKGYYLAAVKDPHKNEEGG--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VALAVDSNYLDKALVTIKSI--CVYNRNITFYLFNQDTPVEWVRNINRKLEPLGS-KLIN
                                                                                                                                                               LHRVVKTGDQSILN-----IVCH--NRWLSLNKTWNFQTYDVVSRYNHRSYLYLNIENRT
                                                                                                                                                                                                                                                                                                                                                                                                                   LGGNWVGACIDLEVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQ 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VKIYNY -----DIAHLTTFLTVSTWFRLFLADYIPS-SRVLYLDSDIIVNTNLDYLFELD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VNPEDFAGFPLNIRH----ISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTD 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CHIRON SPA.
INST GENOMIC RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
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; 2000GB-0028727.
; 2001GB-0005640.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             45;
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239
                                                                                    266
                                                                                                                                                                                                                                                                                                                                   -FNAGMLLANLELWREDGLTKTLLKTAEE
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                                                                                                                                                                                                                                                                                                                                   162
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17-OCT-2000 Arabidopsis t. Protein ident hybridisation termination s. Arabidopsis t. Protein ident hybridisation termination s. Arabidopsis t. EP1033405-A2. 06-SEP-2000. 25-FEB-1999; 05-MAR-1999; 07-MAR-1999; 08-APR-1999; 01-APR-1999; 01-MAY-1999; 01-MAY-1999; 01-MAY-1999; 01-MAY-1999; 01-MAY-1999; 01-MAY-1999; 01-MAY-1999; 01-MAY-1999; 01-JUN-1999; 01-	
(first entry) thaliana protein fragment SEQ ID NO: 16147. tification; signal transduction pathway; metabolic pathway; n assay; seetic mapping; gene axpression control; promoter; sequence. 2000EP-0301439. 905-0121825 905-0121825 905-0121826 905-012788 905-01278	
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18. JUN -1999 18. JUN -1999 18. JUN -1999 18. JUN -1999 22. JUN -1999 23. JUN -1999 24. JUN -1999 25. JUN -1999 26. JUN -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 20. JUL -1999 21. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29. JUL -1999 29. JUL -1999 20. JUL -1999 20. JUL -1999 21. JUL -1999 22. JUL -1999 23. JUL -1999 24. JUL -1999 25. JUL -1999 26. JUL -1999 27. JUL -1999 28. JUL -1999 29. JUL -1999 29	
99US-01139453 99US-0139750 99US-0139763 99US-0139763 99US-0139817 99US-0140535 99US-0140823 99US-0141842 99US-0141842 99US-0142187 99US-014255 99US-014265 99US-014265 99US-014265 99US-014334 99US-0144331 99US-0144632 99US-01446333 99US-0144632 99US-01446333 99US-01446333 99US-0144632 99US-01447313 99US-0144632 99US-01447313 99US-01447368 99US-01447313 99US-0144732 99US-0149723 99US-0149723 99US-0149723 99US-0149723 99US-0149723 99US-0149723 99US-0149723 99US-0149723 99US-0149723	

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RPIDVNPEDFAGF------PLNIRHISITTYARLKLGEYIADC-DKVLYLDTDVL 106
                                                                                                                                                                                                                                                                                                                                                                       VAITLDVEYLRGSIAAVNSILQHSVCPES-VFFHFI--AVSEETNLLESLVRSVFPGLKF 110
                                                                                                                                                                                                                                                                                                                                                                                                     INLKKWRRHDIFKMSCEWVEQYKDVMQYQDQDILNGL-----FKGGVCYANSRFNFMPT
                                                                                                                              VRDGLKPLWDTDLGGNWVGA---CIDLFVERQEGYKQKIGMADGEY-----YFNAGVLL
                       IDLKKWRRGGYTKRIEKWMEIQRRERIYE----LGSLPPFLLVFAGHVAPISHRWN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ch 11.9%;
1 Similarity 26.3%;
76; Conservative
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99US-0151065.
99US-0151066.
99US-0151066.
99US-0151303.
99US-0154038.
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99US-015836.
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99US-0160741.
99US-016076.
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99US-016081.
99US-016081.
99US-016136.
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                                                                                                                                                                                                  157
                                                                                     211
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                                274
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RESULT 12
AAG15
XXX AAG15
XXX AAG15
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05-MAR-1999;
09-MAR-1999;
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hybridisation assay; genetic mapping; gene expression control; promoter;
termination sequence.
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----QHGLGGDNVRGSCRDLHP------GPVSLLHWSGSGKPWIR 309
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                                                            Score 197.5; DB 21; Pred. No. 2.7e-12; 38; Mismatches 104;
                                                               Indels
                                                                              Length
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                                                               Gaps
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                                                                                                                  Query Match
Best Local :
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                                                                                                                                                                                          AAA05803 to AAA05872 encode proteins, polypeptides and peptides (given in AAY91275 to AAY91343) isolated from Group B Streptococcus (GBS), als Known as Streptococcus agalactiae. The GBS polynucleotides and polypeptides have antibacterial activity. Immunogenic compositions comprising GBS polynucleotides or polypeptides can be used as vaccines and for the treatment or prophylaxis of GBS infection. The polynucleotides and polypeptides can also be used in the detection of G and for screening DNA encoding bacterial cell envelope associated or screened antigens in gram positive bacteria. AAA05873 to AAA05941 represent primers used in the exemplification of the present invention.
                                                                                                                                                                                                                                                                                                                                                              Claim 1;
                                                                                                                                                                                                                                                                                                                                                                                         New Group B Streptococcus protein, useful as vaccine, for diagnosis of Streptococcal infections and for screening of antibodies or affibodies
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27-JUL-1998;
19-MAR-1999;
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antibody; affibody; antibacterial.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Group B Streptococcus; Streptococcus agalactiae; protein antigen; vaccine; screening; immunogen; detection; diagnosis; infection;
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                                                                                                                                                                 Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Le Page RWF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (MICR-) MICROBIAL TECHNICS LTD
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             58 IRFIDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDT 117
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -----QHGLGGDNVRGSCRDLHP------GPVSLLHWSGSGKPWIR
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                                              VVLAGDYSYIRQIETTLKSLCVYHENLSI--FIFNQDIPQEWFLAMKDRVGQTGNQIQDV 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDLKKWRRGGYTKRIEKWMEIQRRERIYE----LGSLPPFLLVFAGHVAPISHRWN----
                                                                                                                      Similarity
                                                                                                                                                                                                                                                                                                                                                             Fig 1; 123pp;
                                                                                                                                                                   313
                                                                                                        Conservative
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99US-0125163.
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28.1%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Streptococcus; GAS; GBS; group B streptococcus; Streptococcus agalactiae; group A streptococcus; Streptococcus pyogenes; antibacterial; antiinflammatory; infection; vaccine; meningitis; gene therapy.
                                                           Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to detect Streptococcus in a biological sample. (I) is used to determine whether a compound binds to (I). A composition comprising (I) or a nucleic acid encoding (I), may used as a vaccine or diagnostic composition. The disease caused by Streptococcus that is prevented or treated may be meningitis. Nucleic
                                                                                                                                                                       The invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agalactiae) or group A streptococcus/GAS (Streptococcus pyogenes), comprising one of 5483 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory activity. (I), nucleic acids encoding (I), ABN66044-ABN71526 and antibodies that bind (I) are used in the manufacture of medicaments for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptococcus agalactiae.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        02-JUL-2002
             acid encoding (I) may be used to recombinantly produce (I) and may be used in gene therapy. Antibodies to (I) are used for affinity chromatography, immunoassays, and distinguishing/identifying
                                                                                                                                                                                                                                                                                        Claim 1;
                                                                                                                                                                                                                                                                                                                                       New Streptococcus protein for the treatment or prevention of infection or disease caused by Streptococcus bacteria, such as meningitis, and
                                                                                                                                                                                                                                                                                                                                                                                       WPI; 2002-352536/38
N-PSDB; ABN69181.
                                                                                                                                                                                                                                                                                                                                                                                                                                    Telford J,
Tettelin H;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27-OCT-2000;
24-NOV-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            02-MAY-2002
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ABP28550 standard; Protein; 398
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              29-OCT-2001;
                                                                                                                                                                                                                                                                                                                      for detecting a compound that binds
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              118
                                                                                                                                                            the treatment or prevention of infection or disease caused by
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (GENO-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (CHIR-) CHIRON SPA. (GENO-) INST GENOMIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 178
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KLFHDHLSPKWENKKLN--HINYMTYARYFIPQYIS-ADTVLYLDSDLVVTTNLDNLFQI 121
                                                                                                                                                                                                                                                                                       Page 3791; 4525pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ; 2000GB-0026333.
; 2000GB-0028727.
; 2001GB-0005640.
                                                                                                                                                                                                                                                                                                                                                                                                                                                 Masignani V,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (first entry)
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RESULT 15
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Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           27-OCT-2000;
24-NOV-2000;
07-MAR-2001;
The invention relates to a protein (ABP25413-ABP30895) from group B streptococcus/GBS (Streptococcus agaiactiae) or group A streptococcus/GBS (Streptococcus sequences of 5483 sequences (S1), given in the specification. The proteins have antibacterial and antiinflammatory
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Streptococcus; GAS; GBS; group B streptococcus; Streptococcus agalactiae; group A streptococcus; Streptococcus pyogenes; antibacterial; antiinflammatory; infection; vaccine; meningitis; gene therapy.
                                                                                                                                                                                        New Streptococcus protein for the treatment or prevention of infection or disease caused by Streptococcus bacteria, such as meningitis, and for detecting a compound that binds to the protein -
                                                                                                                                                                                                                                                                                                      WPI; 2002-352536/38.
N-PSDB; ABN68042.
                                                                                                                                                                                                                                                                                                                                                                                                                Telford J,
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                                                                                                                                   Claim 1; Page 3555; 4525pp; English
                                                                                                                                                                                                                                                                                                                                                                                       rettelin
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          165
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       KLFHDHLSPKWENKKLN--HINYMTYARYFIPQYIS-ADTVLYLDSDLVVTTNLDNLFQI 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RTNTAMPVAVSHYCGSAKPW 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KNQKEIENANEGDQTILNRMFENQVIYLDDTYNFQ-----IGFDMGAAIDGHKFIFD
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SLDNAYLAAVPALF -----
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; 2000GB-0028727.
; 2001GB-0005640.
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Pred. No. 3.8e-12;
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                                                                                                                                                                                                                                                                                                                                                                                             activity. (I), nucleic acids encoding (I), ABN66044-ABN71526 and antibodies that bind (I) are used in the manufacture of medicaments for the treatment or prevention of infection or disease caused by Streptococcus bacteria, particularly S. agalactiae and S. pyrogenes. Nucleic acids encoding (I) are used to determine whether a compound binds to (I). A composition comprising (I) or a nucleic acid encoding (I), may be used as a vaccine or diagnostic composition. The disease caused by Streptococcus that is prevented or treated may be meningitis. Nucleic acid encoding (I) may be used to recombinantly produce (I) and may be used in gene therapy. Antibodies to (I) are used for affinity chromatography, immunoassays, and distinguishing/identifying
                                                                                                                                                                                                                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                  Streptococcus proteins.
153
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                                                                                                                                                                        143
                                261 ERFTE 265
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                                                                                                                                                                                                     --GDG-IYFNSGVMLINSLYWMRYRVTEKLLEITERELDNGIFGDQGVLNLLFDNNWLKL 105
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SRFRE
                                                                 EDKYNAQVGNDLGAFYENWQG-----YFDR-NFESPTII-HYCTHDKPWN----TFSS
                                                                                                   NSRFNEMPTN--YAFMANGFASRHTDPLYLDRTNTAMPVAVSHYCGSAKPWHRDCTVWGA
                                                                                                                                                                                                                                                                            l Similarity 33.(61; Conservative
                                                                                                                                                                                                                                                                                                                                               312 AA;
                                                                                                                                                                                                                                                                                            11.8%;
33.0%;
                                                                                                                                                                                                                                                                          22;
                                                                                                                                                                                                                                                                         Score 196; DB 23;
Pred. No. 3.4e-12;
                                                                                                                                                                                                                                                                                                             Length 312;
                                                                                                                                                                                                                                                                            Indels
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Post-processing: Minimum Match 0%
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      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
    280
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US-08-878-360-4
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US-09-376-330-28
US-09-376-330-29
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ALIGNMENTS	US-08-220-151-4 US-08-413-118-4 US-08-296-791-5 PCT-US95-1061A-5. US-09-542-331-1 US-09-510-791-1 US-09-516-320-3 US-09-208-716-3 US-09-208-716-3 US-09-316-330-34 US-09-376-330-70A-1 US-09-521-780-3 US-09-521-780-3	US-08-961-083-70 US-09-434-066-23 US-09-073-297-5
	Sequence 4, Appli Sequence 4, Appli Sequence 5, Appli Sequence 5, Appli Sequence 1, Appli Sequence 1, Appli Sequence 16, Appli Sequence 3, Appli Sequence 3, Appli Sequence 31, Appli Sequence 31, Appli Sequence 31, Appli Sequence 32, Appli Sequence 32, Appli Sequence 33, Appli Sequence 34, Appli Sequence 37, Appli Sequence 37, Appli	5, 23,

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US-08-312-387B-4
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GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COUNTRY: USA

ZIT: 07501

COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/312,387B
FILING DATE: July 7, 1994
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence 4, Application US/08312387B Patent No. 5545553
                                                                                                                             Query Match
                                                                                                                                                                                                                             INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
LENGTH: 306 amino acid
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                  ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION UNMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1
TELEPHONE: 201 487-5800
TELEPHAX: 201 343-1684
                                                                                                                                                                                      TOPOLOGY: linear MOLECULE TYPE: protein
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ADDRESSEE: Klauber & Jackson
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STATE: New Jerse
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STREET: 41
                                                                                  Match 100.0%; Score 1657; DB 1; Local Similarity 100.0%; Pred. No. 9.9e-171; les 306; Conservative 0; Mismatches 0;
amino acid
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                                                                                                                                       ; MOLECULE TYPE: protein US-08-683-426-4
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Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GENERAL INFORMATION:
                                                                                                                                                                                                                                             TELEX: 133521
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
LENGTH: 306 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                          NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                     CLASSIFICATION: 536
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/312,387
FILLING DATE: September 26, 1994
CLASSIFICATION: 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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CITY: Hackensack
STATE: New Jersey
COUNTRY: USA
ZIP: 07601
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                 CLASSIFICATION: 536
ATTORNEY/AGENT INFORMATION:
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                                                                    Conservative
                                                                                                                                                                          linear
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                                                                                 100.0%;
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Pred. No. 9.9e-171;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARRE: Pc-DOS/MS-DOS
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/683,458
FILING DATE:
CLASSTERM:
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                                                                    Matches 306;
                                                                                    Query Match
Best Local Similarity
                                                                                                                                                                                                                                         TELEX: 133521
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                       NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELLEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: GL.
TITLE OF INVENTION: OL.
NUMBER OF SEQUENCES: 1:
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                       SEQUENCE CHARACTERISTICS:
LENGTH: 306 amino acid
                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., Davi
                                                                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 1994
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COUNTRY:
                                                                                                                                                                      TYPE: amino acid TOPOLOGY: linear
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CITY: Hackensack
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MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLRGGGNIRF 60
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                                                                                                                                                                                                         306 amino acids
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IVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS

IVENTION: OLIGOSACCHARIDES, AND GENES ENCODING T
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                                                                    Conservative
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                                                                                  Score 1657; DB 1; Pred. No. 9.9e-171;
                                                                    Mismatches
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RESULT 4
US-08-878-360-4
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                                                                    us-08-878-360-4
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 Best Local Similarity Matches 306; Conserv
                                  Query Match
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                                                                                                                                             TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
NUMBER OF SEQUENCES: 12
                                                                                                                                                                                             NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELLEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER: IBM PC COMPUTED COMPUTER: IBM PC COMPUTED COS MS-DOS SOFTWARE: Patentin Release #1.0, CURRENT APPLICATION DATA:

APPLICATION NUMBER: US/08/878,36 FILING DATE: 18-JUN-1997
                                                                                  MOLECULE TYPE:
                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: 08/3:
FILING DATE: September 2:
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David
                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION DATA: APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
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                                                                                                  TOPOLOGY:
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                                                                                                                                                                                                                                                                                                                                                                                                                    CLASSIFICATION: 435
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CITY: Hackensack
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                                                                                                                                  LENGTH:
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                                                                                                  1: 306 amino acids
   amino acid

OGY: linear
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   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Klauber & Jackson
                                                                                                                                                                                                                                                                                                                               September 26,
                                                                                                                                                                                                                                                                                                                                                                                                                                18-JUN-1997
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100.0%; Si
100.0%; P
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             Score 1657; DB 2;
Pred. No. 9.9e-171;
   Mismatches
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                                                           US-08-478-140B-4
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                                                                                                                               REFERENCE/DOCKET NUMBER: 7188-
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 790-9990
TELEFAX: (212) 869-9741/8864
TELEX: 66141 PENNIE
INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
 Best Local Sin Matches 306;
                             Query Match
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                                                                      TYPE: amino a TOPOLOGY: li
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TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
                                                                                                                                                                                                                                    APPLICATION NUMBER: US/08/478,140B
FILLING DATE: 07-JUN-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Laura A. COTUZZI
REGISTRATION NUMBER: 30,742
                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC DOS/MS DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: JOHNS APPLICANT: ROTH, BUCZA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES: 8
CORRESPONDENCE ADDRESS:
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STATE: New Yor
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                                                                                                                  LENGTH:
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                                                                                                                     306 amino acids
100.0%; ilarity 100.0%; Conservative 0
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Score 1657; DB 3; Pred. No. 9.9e-171; Mismatches 0;
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                             Length
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US-09-333-412-4
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Patent No. 6342382
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil (
 Best Local Similarity
                   Query Match
                                                                                                                                                                    TELEX: 133521
INFORMATION FOR SEQ ID NO: 4:
SEQUENCE CHARACTERISTICS:
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                                                                                                                                                                                                                                                                                                                                                                                                                      CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible

OPERATING SYSTEM: PC-DOS/MS-DOS

SOFTWARE: Patentin Release #1.0, Version #1.25
                                                                                               TOPOLOGY: linear MOLECULE TYPE: protein
                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
STREET: 411 Hackensack Avenue
                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
                                                                           SEQUENCE DESCRIPTION: SEQ ID NO: 4:
                                                                                                                                                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION:
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                                                                                                                              TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CITY: Hackensack
STATE: New Jersey
                                                                                                                                                                                                                                                                                                       NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742
                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994
                                                                                                                                                    LENGTH: 306 amino acids
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NVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
OLIGOSACCHARIDES, AND GENES ENCODING THE
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100.0%;
Score 1657; DB 4; Pred. No. 9.9e-171;
               Length 306;
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RESULT 7
US-09-338-943-4
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Matches
                                                                                       TELEX: 66141 PENNIE INFORMATION FOR SEQ ID NO: 4:
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APPLICANT:
                                                                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
                SEQUENCE CHARACTERISTICS:
LENGTH: 306 amino acid
TYPE: amino acid
TOPOLOGY: linear
                                                                                                                                                                                                                                                                 CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: ROTH, STEPHEN
APPLICANT: BUCZALA, STEPHANIE L.
TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
                                                                                                                                           TELECOMMUNICATION INFORMATION: TELEPHONE: (212) 790-9090
                                                                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
NAME: Laura A. Coruzzi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CORRESPONDENCE ADDRESS
MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STATE: N
COUNTRY:
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                                                                                                                                                                           NAME: Laura A. Coruzzi
REGISTRATION NUMBER: 30,742
REFERENCE/DOCKET NUMBER: 71
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                                                                                                                          TELEFAX:
                                                                                                                                                                                                                                                     FILING DATE:
                                                                                                                                                                                                                                                                                                                            FILING DATE:
                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CITY: New York
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                                                    306 amino acids
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RESULT 9
US-09-376-330-27
; Sequence 27, Application US/09376330
; Patent No. 6399321
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US-09-376-330-28
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SOFTWARE: FastSEQ for Windows Version 3.0 SEQ ID NO 28 LENGTH: 106
TYPE: PRT
ORGANISM: Artificial Sequence
FEATURE:
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Best Local Similarity
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CURRENT FILING DATE: 1999-08-18
NUMBER OF SEO ID NOS: 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             APPLICANT: Tessier, Daniel C.
APPLICANT: Dignard, Daniel C.
APPLICANT: Dignard, Daniel
APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION: Method for screening for
TITLE OF INVENTION: UDP-glucose:glycoprotein glucosyltransferase (UGGT) activity
TITLE OF INVENTION: and nucleic acid encoding for UGGT
FILE REFERENCE: 2139-9*US*
                                                                                                                                                                                                                   152
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o. 6399321
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                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                 35.2%; Score 583; DB 4; 1 llarity 100.0%; Pred. No. 2.1e-55; Conservative 0; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           100.0%; Score 1657; DB 4; 100.0%; Pred. No. 9.9e-171;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                 Length 106;
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APPLICANT: Dignard, Daniel
APPLICANT: Bergeron, John J.M.
APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION: Method for screening for
TITLE OF INVENTION: Method for screening for
TITLE OF INVENTION: and nucleic acid encoding for UGGT
TITLE OF INVENTION NUMBER: US/09/376,330
CURRENT APPLICATION NUMBER: US/09/376,330
CURRENT APPLICATION NUMBER: US/09/376,330
CURRENT FILING DATE: 1999-08-18
NUMBER OF SEQ ID NOS: 35
SOFTWARE: FastSEQ for Windows Version 3.0
SEQ ID NO 27
LENGTH: 106
TYPE: PRT
ORGANISM: Artificial Sequence
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US-08-961-083-200
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ; OTHER INFORMATION: GLUT-H. inf US-09-376-330-27
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence 200, Application US/08961083 Patent No. 6159469
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GENERAL INFORMATION:
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APPLICANT: Choi e
                                                                                                        TELEFAX: (301) 309-85: INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: Diskette, 3.50 inch, 1.4Mb COMPUTER: HP Vectra 486/33 OPERATING SYSTEM: MSDOS Version 6.2 SOFTWARE: ASCII Text CURRENT APPLICATION DATA: APPLICATION MANAGEMENT APPLICATION AP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COUNTRY: USA
ZIP: 20850
COMPUTER READABLE FORM:
MEDIUM TYPE: Diskett
                                                                                                                                                     REFERENCE/DOCKET NUMBER: PB340P2
TELECOMMUNICATION INFORMATION:
TELEPHONE: (301) 309-8504
                                                                                                                                                                                                                                                                                                                                   FILING DATE:
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                             SEQUENCE CHARACTERISTICS:
LENGTH: 674 amino acids
                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Brookes, A. Anders
REGISTRATION NUMBER: 36,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NUMBER OF SEQUENCES: 4
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STREET: 9410 Key
CITY: Rockville
STATE: Maryland
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                                                                                                                             TELEPHONE: (301)
TELEFAX: (301) 30
                                                                                                                                                                                                                                                                                                              FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: US/08/961,08:
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     STRANDEDNESS:
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                                amino acid
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                                                                                             .1) ປະ
) 309-8512
ກາ: 200:
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                                                                                                                                                                                                                           36,373
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RESULT 12
US-09-073-297-6
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US-09-376-330-29
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Dignard, Daniel
APPLICANT: Dignard, Daniel
APPLICANT: Bergeron, John J.M.
APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION: Method for screening for
TITLE OF INVENTION: Upp-glucose:glycoprotein glucosyltransferase (UGGT) activity
TITLE OF INVENTION: and nucleic acid encoding for UGGT
FILE REFERENCE: 2139-9*US*
CURRENT ELIVENTION NUMBER: US/09/376,330
CURRENT FILING DATE: 1999-08-18
NUMBER OF SEQ ID NOS: 35
SOFTWARE: FRSTSEQ for Windows Version 3.0
SEQ ID NO 29
LENGTH: 105
TYPE: PRT
                                                                     Sequence 6, Application US/09073297 Patent No. 6255114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GENERAL INFORMATION:
APPLICANT: Tessier, Daniel C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 29, Application US/09376330 Patent No. 6399321
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                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  FEATURE:
                            APPLICANT:
                                                                                                                                                                                                                                       157 LINLKKWRRHDIFKMSCEWVEQY--KDVMQYQDQDILNGL 194
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                                                                                                                                                                                                63 IIDFESWRKQNITEKVINFINEHPDEDFLVLHDQDALNAI 102
                                                                                                                                                                                                                                                                                                         97 KVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVL 156 ::::|:|| || ||:|::
                                                                                                                                                                                                                                                                                                                                                                    Local Similarity 28.0 ses 28; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MSCEWVEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYL 230
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VNPEDFAGFPLNIR------HISITTYARLKLGEYIADCDKVLYLDTDVLVRDGL 111
                                                                                                                                                                                                                                                                                   RMIYIDCDALVLEDISKLWDLDIAPYTVAAVED----AGQHERLKEMNVTDTGKYFNSGIM 62
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                              LIGHTNER,
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28.0%;
                              JONATHAN EDWARD
                                                                                                                                                                                                                                                                                                                                                                      27;
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                                                                                                                                                                             US-09-376-330-25
                                                                                                                 GENERAL INFORMATION:
                                                                                                                                     Sequence 25, Application US/09376330 Patent No. 6399321
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
                                  APPLICANT: Tessier, Daniel C.
APPLICANT: Dignard, Daniel
APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: 08/852615
FILING DATE: MAY 7, 1997
ATTORNEY/AGENT INFORMATION:
NAME: MAJARIAN, WILLIAM R.
REGISTRATION NUMBER: 41,173
REFERENCE/DOCKET NUMBER: BB-11
TELECOMMUNICATION INFORMATION:
TELEPHONE: 302-992-4926
TELEFAX: 302-773-0164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO: 6:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER READABLE FORM:
MEDIUM TYPE: DISKETTE, 3.50
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: STARCH BIOSYNTHETIC NUMBER OF SEQUENCES: 26
                                                                                                                                                                                                                                                          283
                                                                                                                                                                                                                                                                                                                                                                                                                198
                                                                                                                                                                                                                                                                                                                                                                                                                                                      182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         152
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               135
                                                                                                                                                                                                                                                                                                                                                                       233 TNTAMPVAVSHYCGS-AKPWHRDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCMLQ 291
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: US/09/073,297
FILING DATE:
CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: MICROSOFT WINDOWS
SOFTWARE: MICROSOFT WORD VERSION 7.0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     95
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        80 ITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVER----- 134 : |::|:: |:: |:: |:: |: | | | |:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            TYPE: amino acid
STRANDEDNESS: not
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CITY: WILMINGTON STATE: DELAWARE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ADDRESSEE: E. I. DU PONT D. STREET: 1007 MARKET STREET
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADDRESSEE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LENGTH:
                                                                                                                                                                                                                                                          RW 284
                                                                                                                                                                                                                                                                                             RW
                                                                                                                                                                                                                                                                                                                                                                                                                                                  VMQ-----YQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDR 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VINYSKLRIWEFV-EYERMYYLDADIQVFDNIDHLFDLDKGAFY--AVKDCFCEKTWSHT 151
                                                                                                                                                                                                                                                                                                                                       ----VKVVHYCAAGSKPW-----
                                                                                                                                                                                                                                                                                                                                                                                                              LLDALVVTPPTPFAEQDFLNMFFR-----EQYKPIPNVYNLVL-AMLWRHPENVDLDQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PQYDIGYCQQRPDEVAWPERELGPPPPLYFNAGMFV-----HE-----PGLGTAKD 197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---QEGYKQ----KIGMADGE-----YYFNAGVLLINLKKWRRHDIFKMSCEWVEQYKD 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    19898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      328 amino acids
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                not relevant
                  David Y.
Method for screening
UDP-glucose:glycoprotein glucosyltransferase (UGGT) activity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                8.0%; score 132; DB 4; Length 328; 23.1%; Pred. No. 5.6e-06;
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                                                                                                                                                                                                                                                                                                                                     ----DIKMLVK 282
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RESULT 15
US-09-376-330-24
; Sequence 24, Application US/09376330
; Patent No. 6399321
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US-09-376-330-30
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US-09-376-330-25
                                                                                                                                                                                                                                                                                                                                                                                                                                                          US-09-376-330-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CURRENT APPLICATION NUMBER: US/09/376,330
CURRENT FILING DATE: 199-08-18
NUMBER OF SEQ ID NOS: 35
SOFTWARE: FASTSEQ for Windows Version 3.0
SEQ ID NO 30
LENGTH: 121
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CURRENT APPLICATION NUMBER: US/09/376,330
CURRENT FILING DATE: 1999-08-18
NUMBER OF SEQ ID NOS: 35
SOFTWARE: FASTSEQ for Windows Version 3.0
SEQ ID NO 25
                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity 28.3 Matches 36; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Patent No. 639932
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Best Local Similarity
Matches 35; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION: Method for screening for
TITLE OF INVENTION: UDP-glucose:glycoprotein glucosyltransferase (UGGT) activity
TITLE OF INVENTION: and nucleic acid encoding for UGGT
FILE REFERENCE: 2139-9"US"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TITLE OF INVENTION: and nucleic acid encoding FILE REFERENCE: 2139-9"US"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Tessier, Daniel C. APPLICANT: Dignard, Daniel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LENGTH: 106
TYPE: PRT
ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         OTHER INFORMATION: Q48480-K. p
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ORGANISM: Artificial Sequence
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                                                                                                                          113 DIMNKVF 119
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                                                                                                                                                                 189 DILNGLF 195
                                                                                                                                                                                                                                             148 EY-----YFNAGVLLINLKKWRRHDIF-----KMSCEWVEQYKDVMQYQDQ 188
                                                                                                                                                                                                           62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62 SGVVYLDLKKWADAKLTEKALSILMSKDNVYKYPDQDVMNVLLKG 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           96 DKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMADGE---YYFN 152
                                                                                                                                                                                                                                                                                                                             96 DKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMA------DG 147
                                                                                                                                                                                                                                                                                       σ
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                                                                                                                                                                                                         EYLQKTLNNNPDEYFQAGIIVFNVKQMVEENTFAELMRVLKAKKYW
                                                                                                                                                                                                                                                                                     DKVVFIDSDTVVKADLGELLDVPLGNNLVAAVKDIVM---EGFVKFSAMSASDDGVMPAG 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Dignard, Daniel
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                                                                                                                                                                                                                                                                                                                                                                                      7.3%;
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                                                                                                                                                                                                                                                                                                                                                                   3%; Score 121.5; DB 4;
3%; Pred. No. 1.8e-05;
20; Mismatches 32;
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Best Local Similarity
Matches 32; Conserv
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LENGTH: 110.
TYPE: PRT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Tessier, I
APPLICANT: Dignard,
APPLICANT: Bergeron
APPLICANT: Thomas, I
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: Dignard, Daniel
APPLICANT: Bergeron, John J.M.
APPLICANT: Thomas, David Y.
TITLE OF INVENTION: Method for screening for
TITLE OF INVENTION: UDP-glucose:glycoprotein
TITLE OF INVENTION: and nucleic acid encodin
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION NUMBER: US/09/376,330 CURRENT FILING DATE: 1999-08-18 NUMBER OF SEQ ID NOS: 35
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TITLE OF INVENTION: UDP-glucose:glycoprotein glucosyltransferase (UGGT) activity TITLE OF INVENTION: and nucleic acid encoding for UGGT FILE REFERENCE: 2139-9"US"
                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM: Artificial Sequence
                                                                                                                                                                                                                                                                                                                                                                    FEATURE:
                                                                                  97 KVLYLDTDVLVRDGLKPLWDTDLGGN-------WVGACIDLFVERQEGYKQKIG 143
                                                              57 LVSG--YFNAGFILIXIPLWTAENISKKAIEMLKDPEVVQRITHLDQDVLN 105
                                                                                                                                                6 KVLYLDADIACKGSIQELIDLNFAENEIAAVVAEGELEWWTNARLSLATP------G 56
                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Daniel C.
                                                                                                                                                                                                                                                       6.9%; Score 115; DB 4; 28.8%; Pred. No. 7.7e-05;
2002, 12:03:14
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Search completed: December Job time: 12.3901 secs

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Result
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Maximum Match 100%
Listing first 45 summaries
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DB seq length: 2000000000
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1657
1 MDIVFAADDNYAAYLCVAAK.....KCMLQRWRKKLSARFLRKIY 306
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: /cgn2_6/ptodata/1/pubpaa/US08_NEW_PUB.pep:*
: /cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
: /cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep:*
: /cgn2_6/ptodata/1/pubpaa/US07_NEW_PUB.pep:*
: /cgn2_6/ptodata/1/pubpaa/US07_NEW_PUB.pep:*
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                                   GenCore version 5.1.3 Copyright (c) 1993 - 2002 Compugen Ltd.
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10 US-09-824-482-6

10 US-09-925-299-864

10 US-09-992-598-171

10 US-09-989-722-171

10 US-09-989-727-171

10 US-09-989-727-171

10 US-09-989-732-171

10 US-09-989-732-171

10 US-09-989-732-171

10 US-09-989-732-171

10 US-09-981-073-171

10 US-09-991-073-171

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10 US-09-991-163-171
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US-09-765-272-200
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                                                                                                                                                                                                                                                                           Description
Sequence 4, Appli
Sequence 200, App
Sequence 320, App
Sequence 6, Appli
Sequence 171, App
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US-10-007-267-4
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4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.6	4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.9	4.9	4.9	5.0	ω	5.9	7.1
493	342	333	1169	416	316	316	1066	1066	495	495	311	536	536	566	2310	1019	811	593	437	389	389	756	394	346	281
10	9	10	10	9	10	10	10	9	10	10	9	10	10	10	10	10	10	10	10	12	12	10	12	10	9
US-09-815-242-12052	US-09-911-150-4	US-09-829-482-3	US-09-771-161A-222	US-09-971-536-60	US-09-954-314-10	US-09-765-272-156	US-09-280-197-5	US-09-423-126-3	US-09-815-242-11716	US-09-815-242-5040	US-09-981-876-191	US-09-815-242-12978	US-09-815-242-12372	US-09-829-482-5	US-09-995-542-10	US-09-434-066-23	US-09-895-382-32	US-09-815-242-12306	US-09-765-272-70	US-10-007-693-112	US-10-036-507-15	US-09-745-763-142	US-10-036-507-2	US-09-829-482-2	US-09-895-913A-282
Sequence 12052, A	Sequence 4, Appli	Sequence 3, Appli	Sequence 222, App	Sequence 60, Appl	Sequence 10, Appl	Sequence 156, App	Sequence 5, Appli	Sequence 3, Appli	Sequence 11716, A	Sequence 5040, Ap	Sequence 191, App		Sequence 12372, A	5, A	10	Sequence 23, Appl	Sequence 32, Appl	Sequence 12306, A	Sequence 70, Appl	Sequence 112, App	Sequence 15, Appl	Sequence 142, App	Sequence 2, Appli	e 2, A	Sequence 282, App

ALIGNMENTS

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Sequence 4, Application US/10007267
patent No. US/20020127682A1
GENERAL INFORMATION:
APPLICANT: GOTSCHILCH, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF INVENTION BERS: 1 Jackson Schwarz Jackson Schwarz: Glycosylta Jackson Schwa
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TOPOLOGY: linear;
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MOLECULE TYPE: protein
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SEQUENCE DESCRIPTION: S
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US-09-765-272-200
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sequence 200, Application US/09765272 Patent No. US20020061545A1 GENERAL INFORMATION:
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                               TELEPHONE: (301) 309-65:
TELEPAX: (301) 309-85:
INFORMATION FOR SEQ ID NO: 200:
SEQUENCE CHARACTERISTICS:
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                                                                                                    NAME: Brookes, A. Anders
REGISTRATION NUMBER: 36,373
REFERENCE/DOCKET NUMBER: PB340P2
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                          APPLICATION NUMBER: 08/961,083 FILING DATE: <Unknown> ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                    OPERATING SYSTEM: MSDOS version 6.2
SOFTWARE: ASCII Text
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER READABLE FORM:
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TITLE OF INVENTION: Streptococcus pneumoniae Antigens and Vaccines
                                                                                                                                                                                                                                PRIOR APPLICATION DATA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES: 452
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                                                                                                                                                                                                                                             APPLICATION NUMBER: US/09/765,272
FILING DATE: 22-Jan-2001
CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                            CITY: Rockville
STATE: Maryland
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ADDRESSEE: Human Genome Sciences, STREET: 9410 Key West Avenue
                                                                                                                                                                                                                                                                                                                                                       COMPUTER: HP Vectra 486/33
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                          MEDIUM TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                            ZIP:
                  LENGTH: 674 amino acids
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Pred. No. 6.2e-161;
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; MOLECULE TYPE: protein; SEQUENCE DESCRIPTION: SEQ ID NO: US-09-765-272-200
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; Sequence 320, Application US/09881752A
; Patent No. US20020115078A1
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Best Local S
Matches 75
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LENGTH: 372
TYPE: PRT
ORGANISM: Helicobacter
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Kleanthous, Harold APPLICANT: Al-Garawi, Amal APPLICANT: Miller Charles
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: Identification of Polynucleotides TITLE OF INVENTION: Encoding No. US20020115078A1el HTITLE OF INVENTION: Genome FILE REFERENCE: 06132/041002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        112 KPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMA-DGEYYFNAGVLLINLKKWRRHDIFK 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             328 KRLEKFDSEIINCRVTSEQISCYKSDISYTVFLRYFIADFVQE-DKALYLDCDLVVTKNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    283 IVLAANYGYVDQVLTTIKSI--CYHNRSIRFYLIHSDFPNE-------WIKQLN 327
 148
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                                                                                                                                                                                                               IVFAADDNYAAYLCVAAKSVEAA----HPDTE-----IRFHVLDAGISEENRAAVAAN 51
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                                                                                                                                                    L---RGGGNIRFIDVNPEDFAGFP-----LNIRHISITTYA------RLKLGE
                                     LFPQYDKIIMFDADTLFLNDVSESFFIPLDGYYFGAAKDFASDKSPKHFQIVREKDPRQA 186
                                                                         YIADCDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMADG---
                                                                                                              LAPFSAFSSLEFLDISTPNLHATPIEPSAIDKINEAFLQLNIYAKTRFSKMVMCRLFLAS 126
                                                                                                                                                                                         IVIAFDNHYAMPAGVSLYSMLACAKTEHPQSQNDSEKLFYKIHCLVDNLSLENQSKLKET 66
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25.1%;
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-FNAGVLLINLKKWRRHDIFKMSCEWVEQYKDVMQYQDQDI 190
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Pred. No. 3e-08;
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Pred. No. 7.
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; TOPOLOGY: line: not relevant; MOLECULE TYPE: peptide; SEQUENCE DESCRIPTION: SEQ ID NO: US-09-829-482-6
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                                                                                                                                                                                                              Query Match
                                                                                                                                                                            Matches
                                                                                                                                                                                                                                                                                                                                                                                   INFORMATION FOR SEQ ID NO: 6:
                                   152 POYDIGYCOORPDEVAMPERELGPPPPLYFNAGMFV-----HE-----PGLGTAKD 197
                                                                       135
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                                                                                                         95
                                                                                                                                      80 ITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVER----- 134
                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: DISKETTE, 3.50 INCH
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: MICROSOFT WINDOWS 95
SOFTWARE: MICROSOFT WORD VERSION 7.0A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/852615
PILING DATE: MAY 7, 1997
ATTORNEY/AGENT INFORMATION:
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ADDRESSEE: E. I. DU PONT DE NEMOURS AND COMPANY
STREET: 1007 MARKET STREET
                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                      TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: LIGHTNER, JONATHAN EDWARD
TITLE OF INVENTION: STARCH BIOSYNTHETIC ENZYMES
                                                                                                      VINYSKLRIWEFV-EYERMYYLDADIQVFDNIDHLFDLDKGAFY--AVKDCFCEKTWSHT 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                  ---QEGYKQ----KIGMADGE-----YYFNAGVLLINLKKWRRHDIFKMSCEWVEQYKD 181
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GKPW-
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LNGLFKGGVCYANSRFNFMP----TNYAFMANGFASRHTDPLYLDRTNTAMPVAVSHYCGS 247
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          FSLYEHYLNESDMQIIYESNYNAGFLVVNLKLWRADHLEERLLNLTHQKGQCVFYPEQDL 246
   VMQ-----YQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDR 232
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LT-----LACY--QKVLILPYIYNTHPFMAN---QKRFIP---DKKE----IVMLHFYFV 289
                                                                                                                                                                                          8.0%;
Similarity 23.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                      NAME: MAJARIAN, WILLIAM R.
REGISTRATION NUMBER: 41,173
REFERENCE/DOCKET NUMBER: BB-1083-B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: US/09/829,482 FILING DATE: 10-Apr-2001
                                                                                                                                                                                                                                                                                                               STRANDEDNESS: not relevant
                                                                                                                                                                                                                                                                                                                                   TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STATE: DELAWARE
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                                                                                                                                                                                                                                                                                                                                                   LENGTH: 328 amino acids
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                                                                                                                                                                                          Score 132; DB 10;
Pred. No. 8.9e-06;
                                                                                                                                                                          Mismatches
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                                                                                                                                                                                                          Length 328;
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US-09-925-299-864
                                                                                                                                                        GENERAL INFORMATION:
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APPLICANT: Rosen et
                                                                                                                                                                       Sequence 171, Application US/09992598 Patent No. US20020160384A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
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CURRENT FILING DATE: 2001-08-10
PRIOR APPLICATION NUMBER: PCT/US00/05883
PRIOR FILING DATE: 2000-03-08
PRIOR APPLICATION NUMBER: 60/124,270
PRIOR FILING DATE: 1999-03-12
NUMBER OF SEQ ID NOS: 1556
                                                                                    APPLICANT: APPLICANT:
                                                                                                                    APPLICANT: Ashkenazi, Avi J
APPLICANT: Baker, Kevin P.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICANT: Rosen et al.
TITLE OF INVENTION: Nucleic Acids, Proteins
FILE REFERENCE: PA102
                                                    APPLICANT:
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                                   APPLICANT:
   APPLICANT:
                   APPLICANT:
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OTHER INFORMATION:
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                                                  Ferrara, Napoleone
                                                                                                    Baker, Kevin P. Botstein, David
Gerber, Hanspeter
Gerritsen, Mary E.
                                  Fong, Sherman
                                                                      Eaton, Dan
                                                                                    Desnoyers, Luc
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Pred. No. 7.
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140 QK----IGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYKDVMQYQDQDILNGLF 195
                                                            196 KGGVCYANSRENEMPTNYAFMANGEASRH----TDPLYLDRTNTAMPVAVSHYCGSAKPW 251
                                                                                                                                                                                                                                                            16 KVIYLDDDVIVQGDIQELYDTTLALGHAAAFSDDCDLPSAQDINRLVGLQNTYMGYLDYR 75
                                                                                                                                                                                                                                                                                                                           97 KVLYLDTDVLVRDGLKPLWDTDLGGNWVGACID-----LFVERQEG-----YK 139
GGGVATSPXLIVF-HGKYSTINPLWHIRHLGWNPDARYSE--HFLQEAKLLHWNGRHKPW 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TNTAMPVAVSHYCGS-AKPWHRDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCMLQ 291
                                                                                                                            KKAIKDLGISPSTCSFNPGVIVANMTEWKHQRITKQLEKWMQ--KNV----EENLYSSSL 129
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APPLICANT:
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CURRENT FILING DATE: 2001-11-14
PRIOR APPLICATION NUMBER: 60/049787
PRIOR FILING DATE: 1997-06-16
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LE OF INVENTION:
LE OF INVENTION:
E REFERENCE: P2730
                                                                                                                                                                                                          DR FILING DATE: 1998-06-02
R APPLICATION NUMBER: 60/08
R FILING DATE: 1998-06-02
R FILING DATE: 1998-06-02
R FILING DATE: 1998-06-03
R FILING DATE: 1998-06-04
PR FILING DATE: 1998-06-04
R APPLICATION NUMBER: 60/08
PR FILING DATE: 1998-06-04
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DR FILLING DATE: 1997-11-24
DR APPLICATION UNMBER: 60/07
DR FILLING DATE: 1997-11-24
DR APPLICATION NUMBER: 60/07
DR FILLING DATE: 1998-02-25
DR APPLICATION NUMBER: 60/07
DR FILLING DATE: 1998-03-20
DR APPLICATION NUMBER: 60/08
DR APPLICATION NUMBER: 60/08
DR APPLICATION NUMBER: 60/08
DR FILLING DATE: 1998-04-28
DR FILLING DATE: 1998-05-07
DR APPLICATION NUMBER: 60/08
DR FILLING DATE: 1998-05-07
DR APPLICATION NUMBER: 60/08
DR FILLING DATE: 1998-05-07
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APPLICATION NUMBER: 60/062250
FILING DATE: 1997-10-17
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APPLICATION NUMBER: 60/065186
FILING DATE: 1997-11-12
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Godowski, Paul J.
Grimaldi, J.Christopher
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art, Timothy A.
                                                                      NUMBER: 60/0: 1998-06-05
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RESULT 7
US-09-989-722-171
    ; GENERAL INFORMATION:
; APPLICANT: Ashkenazi
; APPLICANT: Baker,Ke
; APPLICANT: Botstein
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Best Local S
Matches 48
                                                                              Sequence 171, Application US/09989722 Patent No. US20020072067A1
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APPLICATION NUMBER: 60/090863
FILING DATE: 1998-06-26
APPLICATION NUMBER: 60/091360
FILING DATE: 1998-07-01
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APPLICATION NUMBER: 60/091978
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APPLICATION NUMBER: 60/090690
FILING DATE: 1998-06-25
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APPLICATION NUMBER: 60/090676
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APPLICATION NUMBER: 60/091633
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                                        Ashkenazi, Avi J
    Baker, Kevin P. Botstein, David
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PRIOR FILING DATE: 1997-11-12
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CURRENT APPLICATION NUMBER: US/09/989,722
CURRENT FILING DATE: 2001-11-19
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APPLICATION NUMBER: 60/088167
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APPLICATION NUMBER: 60/088202
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Kljavin, Ivar J.
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Stewart, Timothy A.
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Grimaldi, J.Christopher
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APPLICATION NUMBER: 60/0

APPLICATION NUMBER: 60/ FILING DATE: 1998-06-05

APPLICATION NUMBER:

60/088655 60/088217 60/088212

FILING DATE: 1998-06-09

PRIOR PRIOR

R FILING DATE: 1998-06-11
R APPLICATION NUMBER: 60/08
R FILING DATE: 1998-06-12
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APPLICATION NUMBER: 60/088861 FILING DATE: 1998-06-11 APPLICATION NUMBER: 60/088876

APPLICATION NUMBER: 60/ FILING DATE: 1998-06-11 APPLICATION NUMBER: 60/ FILING DATE: 1998-06-10 FILING DATE: 1998-06-10 APPLICATION NUMBER: 60/088824 FILING DATE: 1998-06-10 APPLICATION NUMBER: 60/088810 FILING DATE: 1998-06-10

60/088858 60/088826

FILING DATE: 1998-06-16 APPLICATION NUMBER: 60/089514 FILING DATE: 1998-06-16

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APPLICATION NUMBER: 60/089532 FILING DATE: 1998-06-17

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OR APPLICATION NUMBER: 60/090862
OR APPLICATION NUMBER: 60/090863
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OR APPLICATION NUMBER: 60/091360
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OR FILING DATE: 1998-07-02
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RESULT 8
US-09-989-723-171
; Sequence 171, Application US/09989723
; Patent No. US20020072092A1

PRIOR PRIOR

APPLICATION NUMBER:

60/090355

60/090349 60/090254 60/090252 60/090246

APPLICATION NUMBER: 60/0 FTILING DATE: 1998-06-22 FILING DATE: 1998-06-22 APPLICATION NUMBER: 60/ FILING DATE: 1998-06-23

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R FILING DATE: 1998-06-23
R APPLICATION NUMBER: 60/01
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APPLICATION NUMBER: 60/089948
FILING DATE: 1998-06-19
APPLICATION NUMBER: 60/089952
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DR APPLICATION NUMBER: 60/089801

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FILING DATE: 1998-UD-1,
APPLICATION NUMBER: 60/089598
APPLICATION 1998-06-17
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FILING DATE: 1998-06-17 APPLICATION NUMBER: 60/089599 FILING DATE: 1998-06-17

APPLICATION NUMBER: 60/089600 FILING DATE: 1998-06-17 APPLICATION NUMBER: 60/089653

NUMBER: 60/089653 1998-06-17

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GENERAL INFO
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TITLE OF INVENTION: Secreted and Transmembran
TITLE OF INVENTION: Acids Encoding the Same
FILE REFERENCE: PZ730P1C62
CURRENT APPLICATION NUMBER: US/09/989,723
CURRENT FILING DATE: 2001-11-19
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Roy, Margaret Ann
Stewart, Timothy A.
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Godowski, Paul
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211 GAGNQYNYIG-----YLDYKKERIRKLSMKASTCSFNPGVFVANLTEWKRQNITNQLEKW 265
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R APPLICATION NUMBER: 60/090694
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APPLICATION NUMBER: 60/091626
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RESULT 9
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; Sequence 171, Application US/09989279
; Patent No. US20020072496A1
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TITLE OF INVENTION: Secreted and Transmembra
TITLE OF INVENTION: Acids Encoding the Same
FILE REFERENCE: P2730P1C56
CURRENT APPLICATION NUMBER: US/09/989,279
CURRENT FILING DATE: 2001-11-19
PRIOR APPLICATION NUMBER: 60/049787
PRIOR APPLICATION NUMBER: 60/062250
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APPLICANT: Baker,Kevin P.
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   APPLICATION NUMBER: 60/087607
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Stewart, Timothy A.
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Pred. No. 0.00025;
B; Mismatches 74;
YSRTLAGSITTPPLLIV--FYQQHSTIDPMWNVRH
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DR APPLICATION NUMBER: 60/089598
DR FILING DATE: 1998-06-17
DR APPLICATION NUMBER: 60/089599
DR FILING DATE: 1998-06-17
DR APPLICATION NUMBER: 60/089600
DR FILING DATE: 1998-06-17
DR APPLICATION NUMBER: 60/089653
DR FILING DATE: 1998-06-17
DR APPLICATION NUMBER: 60/089801
DR FILING DATE: 1998-06-18
DR APPLICATION NUMBER: 60/089907
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R FILING DATE: 1998-06-19
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R APPLICATION NUMBER: 60/09
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1998-06-22

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DR APPLICATION NUMBER: 60/089440

DR FILING DATE: 1998-06-16

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DR FILING DATE: 1998-06-16

DR APPLICATION NUMBER: 60/089532

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PRIOR APPLICATION NUMBER: 60/065186
PRIOR FILING DATE: 1997-11-12
PRIOR APPLICATION NUMBER: 60/065311
PRIOR FILING DATE: 1997-11-13
PRIOR APPLICATION NUMBER: 60/066770
PRIOR FILING DATE: 1997-11-24
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GENERAL INFORMATION:
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APPLICANT: Zhang, Zemin
TITLE OF INVENTION: Secreted and Transmembrane Polypeptides and Nucleic
TITLE OF INVENTION: Acids Encoding the Same
FILE REFERENCE: P2730P1C65
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PRIOR FILING DATE: 1997-06-16
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       APPLICATION NUMBER: 60/088025
FILING DATE: 1998-06-04
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APPLICATION NUMBER: 60/088021
FILING DATE: 1998-06-04
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FILING DATE: 1998-06-02
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Baker, Kevin P.
Botstein, David
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Watanabe, Colin K.
Williams, P. Mickey
Wood, William I.
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Kljavin, Ivar J.
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Gerritsen, Mary E
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Roy, Margaret Ann
Stewart, Timothy A.
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PRIOR FILING DATE: 1998-06-16
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PRIOR APPLICATION NUMBER: 60/089532
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OR APPLICATION NUMBER: 60/088810
OR FILING DATE: 1998-06-10
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OR APPLICATION NUMBER: 60/088826
OR FILING DATE: 1998-06-10
OR APPLICATION NUMBER: 60/088826
OR FILING DATE: 1998-06-11
OR APPLICATION NUMBER: 60/088858
OR APPLICATION NUMBER: 60/088858
OR APPLICATION NUMBER: 60/0888661
OR FILING DATE: 1998-06-18
OR APPLICATION NUMBER: 60/08
OR FILING DATE: 1998-06-19
OR FILING DATE: 1998-06-19
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Kljavin, Ivar J.
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Botstein, David
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APPLICATION NUMBER: 60/ FILING DATE: 1998-06-04

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                                      38;
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CURRENT FILING DATE: 2001-11-19
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Grimaldi, J. Christopher
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Wart, Timothy A.
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FILE REFERENCE: P2730P1C15
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Williams, P. Mickey
Wood, William I.
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Botstein, David
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Eaton, Dan L.
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DR APPLICATION NUMBER: 60/087106

PRILING DATE: 1998-05-28

PRETICING DATE: 1998-06-02

PRETICATION NUMBER: 60/087609

PRETICING DATE: 1998-06-02

PRETICATION NUMBER: 60/087829

PRETICATION NUMBER: 60/087827

PRETICATION NUMBER: 60/088021

PRETICATION NUMBER: 60/088021

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PRETICATION NUMBER: 60/088025

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PRETICING DATE: 1998-06-10

PREPLICATION NUMBER: 60/088212

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Best Local :
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PRIOR APPLICATION NUMBER: 60/049787
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TITLE OF INVENTION: Secreted and Transmembrane Polypeptides
TITLE OF INVENTION: Acids Encoding the Same
FILE REFERENCE: P2730PIC8
FILE REFERENCE: P2730PIC8
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             DR FILING DATE: 1997-11-12

RAPPLICATION NUMBER: 60/65311

DR FILLYG DATE: 1997-11-13

DR APPLICATION NUMBER: 60/066770

DR FILING DATE: 1997-11-24

DR PPLICATION NUMBER: 60/075945

DR FILING DATE: 1998-02-25
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FILING DATE: 1998-07-07
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Williams, P. Mickey
Wood, William I.
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Gerber, Hanspeter
Gerritsen, Mary E.
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Godowski, Paul J.
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38; Mismatches
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R APPLICATION NUMBER: 60/01
RR FILING DATE: 1998-06-04
RR APPLICATION NUMBER: 60/01
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FILING DATE: 1998-06-16
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FILING DATE: 1998-06-02
APPLICATION NUMBER: 60/087827
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FILING DATE: 198-06-10
APPLICATION NUMBER: 60/088824
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                           APPLICATION NUMBER: 60/089538
FILING DATE: 1998-06-17
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TITLE OF INVENTION: Secreted and Transmembrane Polypeptides and Nuc.
TITLE OF INVENTION: Acids Encoding the Same
FILE REFERENCE: P2730P1C17
CURRENT APPLICATION NUMBER: US/09/991,163
CURRENT FILING DATE: 2001-11-14
PRIOR APPLICATION NUMBER: 60/062250
PRIOR FILING DATE: 1997-06-16
PRIOR APPLICATION NUMBER: 60/062250
PRIOR APPLICATION NUMBER: 60/062250
PRIOR FILING DATE: 1997-10-17
PRIOR APPLICATION NUMBER: 60/065186
PRIOR APPLICATION NUMBER: 60/065181
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PRIOR APPLICATION NUMBER: 60/091978
PRIOR FILING DATE: 1998-07-07
PRIOR APPLICATION NUMBER: 60/091982
PRIOR FILING DATE: 1998-07-07
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Godowski, Paul
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Eaton, Dan L.
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Botstein, David
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APPLICATION NUMBER: 60/ FILING DATE: 1998-06-25 APPLICATION NUMBER: 60/ FILING DATE: 1998-06-24 APPLICATION NUMBER: FILING DATE: 1998-08

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1998-06-24

DR APPLICATION NUMBER: 60/090472
DR FILING DATE: 1998-06-24
DR APPLICATION NUMBER: 60/090535
DR FILING DATE: 1998-06-24
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DR FILING DATE: 1998-06-24

FILING DATE: APPLICATION NUMBER: APPLICATION NUMBER: 60/ FILING DATE: 1998-06-24 FILING DATE: 1998-06-24 APPLICATION NUMBER:

1998-06-24

60/090445

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FILING DATE: 1998-06-24 APPLICATION NUMBER: 60/090431 FILING DATE: 1998-06-24

FILING DATE: 1998-06 APPLICATION NUMBER: APPLICATION NUMBER:

1998-06-23 1998-06-23 1998-06-22

60/090355 60/090349

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FILING DATE: 1998-0 APPLICATION NUMBER: FILING DATE: 1998-0

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60/090246 60/089952 APPLICATION NUMBER: 60/ FILING DATE: 1998-06-19 FILING DATE: 1998-06-18 APPLICATION NUMBER: 60/089908

60/089947

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APPLICATION NUMBER: 60/089907 FILING DATE: 1998-06-18 APPLICATION NUMBER: 60/089801 FILING DATE: 1998-06-18 APPLICATION NUMBER: 60/089653 FILING DATE: 1998-06-17

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APPLICATION NUMBER: 60/090696 APPLICATION NUMBER: 60/ FILING DATE: 1998-06-25 FILING DATE: 1998-06-25 APPLICATION NUMBER: APPLICATION NUMBER: 60/ FILING DATE: 1998-06-25 APPLICATION NUMBER: 60/ FILING DATE: 1998-06-25

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FILING DATE: 1998-07-01 APPLICATION NUMBER: 60/091478 FILING DATE: 1998-07-02

APPLICATION NUMBER: 60/091544 FILING DATE: 1998-07-01

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APPLICATION NUMBER: 60/091519 FILING DATE: 1998-07-02

OR APPLICATION NUMBER: 60/066770
OR FILING DATE: 1997-11-24
OR APPLICATION NUMBER: 60/075945
OR FILING DATE: 1998-02-25
OR FILING DATE: 1998-03-20
OR APPLICATION NUMBER: 60/08322
OR FILING DATE: 1998-04-28
OR FILING DATE: 1998-04-28
OR APPLICATION NUMBER: 60/087106
OR FILING DATE: 1998-05-20
OR FILING DATE: 1998-05-28
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                                                                                                                                                                                  176 VEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHT--DPLYLDR- 232
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ALIGNMENTS

RESULT C64146

general stress protein gspA - Bacillus subtilis
C;Species: Bacillus subtilis
C;Date: 06-Jan-1994 #sequence_revision 24-Feb-1995 #text_change 08-Dec-2000
C;Accession: S16423; S39667; PS014B; A69638
R;Glaser, P.; Kunst, F.; Debarbouille, M.; Vertes, A.; Danchin, A.; Dedonder, R.
DNA Seq. 1, 251-261, 1991
A;Title: A gene encoding a tyrosine tRNA synthetase is located near sacS in Bacillus
A;Reference number: S16421; MUID:92216127; PMID:1806041
A;Accession: S16423 Rifleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Kerlavage; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; Weidman, D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, N.S.M. Science 269, 496-512, 1995
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; Vente A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae Rd. A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Accession: C64146 A;Status: preliminary
A;Molecule type: DNA
A;Rosldues; 7-286 <GLZ>
A;Cross-references: EMBL:X52480; NID:g40236; PIDN:CAA36721.1; PID:g40239
A;Claser, P.; Kunst, F.; Arnaud, M.; Coudart, M.P.; Gonzales, W.; Hullo, M.F.; RESULT S16423 hypothetical protein HI0259 - Haemophilus influenzae (strain Rd KW20) C;Species: Haemophilus influenzae C;Decies: Haemophilus influenzae C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 08-Oct-1999 C;Accession: C64146 δã Вþ Qy 밁 Ş A;Molecule type: DNA A;Residues: 1-220 <TIGR> A;Cross-references: GB:L42023; TIGR:HI0259; GB:U32711; NID:g1573214; PIDN:AAC21924.1; A; Status: nucleic acid sequence not shown; translation not shown Matches Query Match Best Local 157 119 97 60 39 LGGNWVGACIDLFVE-RQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWV 176 ITNYYLAACRDTFIDVKNEAYKKTIGL-EGYSYFNAGILLINLNKWKEENIFQKSINWM MNIIFSSDHYYAPYLAVSIFSIIKNTP-KKINFYILDMKINQENK-TIINNLASAYSCKV 96 MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLRGGGNIR-FFLPVCESDFQNFPKTIDYISLATYARLNLTKYIKNIEKAIYIDVDTLTNSSLQELWNID 72; Similarity 40.2 72; Conservative 21.1%; 39; Score 349; DB 2; 1 Pred. No. 3.2e-23; 9; Mismatches 62; DB 2; Length 220; Indels 9 Gaps 214 156 59 s

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A; Molecule type: DNA
A; Residues: 110-286 < ZUK>
A; Residues: 110-286 < ZUK>
A; Cross-references: GB: M2933; NID: g143503; PIDN: AAA75337.1; PID: g894066
A; Cross-references: GB: M29333; NID: g143503; PIDN: AAA75337.1; PID: g894066
A; Cross-references: GB: M29333; NID: g143503; PIDN: AAA75337.1; PID: g894066
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A; Cross-references: GB: M29333; NID: g143503; PIDN: AAA75337.1; PID: g894066
A; Cross-references: GB: M29333; NID: g143503; PIDN: AAA75337.1; PID: g894066
A; Cross-references: GB: M29333; NID: g143503; PIDN: AAA75337.1; PID: g894066
A; Cross-references: GB: M29333; NID: g143503; PIDN: AAA75337.1; PID: g894066
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A; Cross-references: GB: M29333; NID: g143503; PID: g14360, PID: g894066
A; Cross-references: GB: M29333; NID: g143503; PID: g14360, PID: g143606
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A; Cross-references: GB: M2933; PID: g143606
A; Cross-references: GB: M2933; PID: g143606
A; Cross-references: GB: M29386
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C; Species: Streptococcus pneu
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A;Title: Nucleotide sequence of the sacS locus of Bacillus subtilis reveals the A;Reference number: JU0293; MUID:90337338; PMID:2116367
A;Accession: PS0148
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A;Experimental source: strain 168
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A; Residues: 1-286 <KUN>
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A; Residues: 1-286 <GLA>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C; Superfamily: lipopolysaccharide glucosyltransferase
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                                                                                                                                                                                                                                        YNETRENPAIVHFCGGEKPWN 256
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                                                                                                                                                                                                                                                                                                                                                                                                                         EQY--KDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDR---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LDIAPYTVAAVED---AGQHERLKEMNVTDTGKYFNSGIMIIDFESWRKQNITEKVINFI 182
                                                                                                                                                                                                                                                                                                             -TNTAMPVAVSHYCGSAKPWH
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                                                          SP1766 [imported] - Streptococcus
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glycosyl transferase, family 8 SP1765 [imported] - Streptococcus pneumoniae C;Species: Streptococcus pneumoniae C;Species: Streptococcus pneumoniae C;Date: 03-Aug-2001 #sequence_revision 03-Aug-2001 #text_change 03-Aug-2001 C;Accession: G95205 R;Tettelin, H.; Nelson, K.E.; Paulsen, I.T.; Eisen, J.A.; Read, T.D.; Peters on, J.D.; Umayam, L.A.; White, O.; Salzberg, S.L.; Lewis, M.R.; Radune, D.; nson, T.; Hickey, E.K.; Holt, I.E. Science 293, 498-506, 2001
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A; Residues: 1-406 <KUR>
A; Cross-references: GB:AE005672; PIDN:AAK75841.1;
A; Experimental source: strain TIGR4
C; Genetics:
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R;Authors: Loftus, B.J.; Yang, F.; Smith, H.O.; Venter, J.C.; Dougherty, B.A.; Morris A;Title: Complete Genome Sequence of a virulent isolate of Streptococcus pneumoniae. A;Reference number: A95000; MUID:21357209; PMID:11463916

A;Accession: H95205
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                                                                                                                                                                                                                                                                                                                A;Authors: Loftus, B.J.; Yang, F.; Smith, H.O.; Venter, J.C.; Dougherty, B.A.; A;Title: Complete Genome Sequence of a virulent isolate of Streptococcus pneumc A;Reference number: A95000; MUID:21357209; PMID:11463916
A;Accession: G95205
                                                                                                                                                                     A;Molecule type: DNA
A;Residues: 1-398 <KUR>
A;Cross-references: GB:AE005672; PIDN:AAK75840.1; PID:gl4973262; GSPDB:GN00164;
A;Experimental source: strain TIGR4
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27.5%; Pred. No. 3.4e-13;
14.1%; Score 233; DB 2
27.5%; Pred. No. 1.1e-1
tive 42; Mismatches 1
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                                                      DB 2;
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iller, L.; Grotbeck, E.J.; Davis, N.W.;
Nature 409, 529-533, 2001
A;Title: Genome sequence of enterohemory
                                                                                probable LPS biosynthesis enzyme waaI [imported] - Escherichia coli (strain
C;Species: Escherichia coli
C;Date: 16-Feb-2001 #sequence_revision 16-Feb-2001 #text_change 14-Sep-2001
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C;Date: 18-Jul-2001 #sequence_revision 18-Jul-2001 #text_change 03-Aug-2001
C;Accession: H91191
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R;Perna, N.T.; Plunkett_III, G.; Burland, V.; Mau,
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C;Superfamily: lipopolysaccharide glucosyltransferase
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A; Residues: 1-335 <HAY>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gasawara, N.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   R; Hayashi, T.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    hypothetical protein ECs4504 [imported] - Escherichia coli (strain 0157:H7, substrain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENR-----AAVAANLRGG 55
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     8, 11-22, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                GNIRFIDVNPEDFAGFPLNIRHISITTYARLKLGEYI-ADCDKVLYLDTDVLVRDGLKPL 114
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  QYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAM 237
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DLKGYSIGAVDDVYA--YEGRKSG------FNTGMLLMDVAKWKEHSIVNSLLELAA 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    DLGGNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVE 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EQNQVVHLGDQSILNIYFEDNWLALDKTYNYMVGIDIYHLAQECERLDD
                                                                                                                                                                                                          DKVDNPVNDD-----TVFIHYVGPTKPWH 272
                                                                                                                                                                                                                                                                                                                                             LDYQFSTNEIAAVV---AERDVEWWQNRASVLTTPQLASG--YFNAGFLLINIDEWNLNN 196
                                                                                                                                                                                                                                                                                                                                                                 WDTDLGGNWVGACIDLFVERQ-EGYKQKIG-----MADGEYYFNAGVLLINLKKWRRHD 167
                                                                                                                                                                                                                                                                                                                                                                                                                --INIYVINCDKLKSLP-STKNWTYATYFRFTIADYFYHKHEKILYLDADIACKGSIKEL 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PPTIVHYASHDKPWN----TYSISRLREL
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                                                                                                                                                                                                                                          SRHTDPLYLDRINTAMPVAVSHYCGSAKPWH 252
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    LDIAFGIDRNFLFGCGVAIASILLNNREISCEFHVFTDYISDKDKLYFSDLAKQYNSR--
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                                                                                                                                                                                                                                                                             ISSKAIEMLRDPDWVSK----ITHLDQDVLNVLLNGKVKFISEKYN---TRYSINYE-LK 248
                                                                                                                                                                                                                                                                                                           IFKMSCE-----WVEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IRFIDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDT 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Yasunaga,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Makino, K.; Ohnishi, M.;
Tasunaga, T.; Kuhara, S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          13.3%;
enterohemorrhagic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          45; Mismatches 109;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 220; Db 2
                                   Lim,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Kurokawa, K.; Ishii, K.;
Shiba, T.; Hattori, M.;
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                                   A.; Dimalanta,
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Escherichia
                                                    В.
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                                Glasner,
lanta, E.;
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coli
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 O157:H7
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                                   J.D.; Rose, Potamousis,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  --N 215
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                                  Д.J.
                                                                                                                      O157:H7,
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                                   Apodaca
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A; Accession: AH0972

As (Authors: Parry, C.; Quail, M.; Rutherford, K.; A; Title: Complete genome sequence of a multiple day. Reference number: AB0502; PMID:11677608
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A;Residues: 1-335 <STO>
A;Cross-references: GB:AE005174; NID:g12518382; PIDN:AAG58773.1; GSPDB:GN00145; UWGP:
A;Experimental source: strain O157:H7, substrain EDL933
C;Genetics:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Reference number: A85480; MUID:21074935; PMID:11206551
A;Accession: A86039
A;Status: preliminary
                                                                                                                                                                                                                                                                       C; Superfamily: lipopolysaccharide glucosyltransferase C; Keywords: glycosyltransferase; hexosyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              lipopolysaccharide 3-alpha-galactosyltransferase (EC 2.4.1.44) - C;Species: Salmonella enterica subsp. enterica serovar Typhi A;Note: this species has also been called Salmonella typhi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Gene: waaI
C;Superfamily: lipopolysaccharide glucosyltransferase
                                                                                                                                                                                                                                                                                                                          A;Gene: waaI
                                                                                                                                                                                                                                                                                                                                                C; Genetics:
                                                                                                                                                                                                                                                                                                                                                                   A;Cross-references: GB:AL513382; PIDN:CAD03276.1; PID:g16504897; GSPDB:GN00176
                                                                                                                                                                                                                                                                                                                                                                                              A; Molecule type: DNA
A; Residues: 1-337 < PAR>
                                                                                                                                                                                                                                                                                                                                                                                                                                       A; Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     R;Parkhill, J.; Dougan, G.; James, K.D.; Thomson, N.R.; Pickard, D.; Wain, J.; th, T.; Connerton, P.; Cronin, A.; Davis, P.; Davies, R.M.; Dowd, L.; White, N
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     C;Date: 09-Nov-2001 #sequence_revision 09-Nov-2001 #text_change
C;Accession: AH0972
                                                                                                                                                                                                                              Query Match
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                                                                                         29 NIAYGIDKNFLFGCGVSIASVLIANREKALAFHVFTDFFGPEDQQRFDALAKQYATQIVV
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                                                                                                                                  2 DIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLD--AGISEENRAAVAANLRGGGNIR 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LDIAFGIDRNFLFGCGVAIASILLNNREISCEFHVFTDYISDKDKLYFSDLAKQYNSR--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENR-----AAVAANLRGG 55
YL-IDCERLKSLP-STKNWTYATYFRFIIADYFSDKTDRVLYLDADIACKGSIQELIDLN
                                           FIDVNPEDFAGFPLNIRHISITTYARLKLGEYIAD-CDKVLYLDTDVLVRDGLKPLWDTD 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LDYQFSTNEIAAVV---AERDVEWWQNRASVLTTPQLASG--YFNAGFLLINIDEWNLNN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SRHTDPLYLDRTNTAMPVAVSHYCGSAKPWH
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       IFKMSCE-----WVEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --INIYVINCDKLKSLP-STKNWTYATYFRFIIADYFYHKHEKILYLDADIACKGSIKEL 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        73; Conser
                                                                                                                                                                                                         Similarity
                                                                                                                                                                                Conservative
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                                                                                                                                                                                                         12.7%; 25.9%;
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                                                                                                                                                                                                      Score 210; DB 2;
Pred. No. 9.5e-11;
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Pred. No. 1.2e-11
                                                                                                                                                                                   Mismatches
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Salmonella
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146
                                                                                         88
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   J.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                enterica
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LGGNWVGACIDLFVERQEG-----YKQKI-----GMADGEYYFNAGVLLINLKKWRRHDI 168

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liopolysaccharide 3-alpha-galactosyltransferase (EC 2.4.1.44) - Escherichia coli (strai N; Alternate names: lipopolysaccharide core assembly protein rfaI; UDP-D-galactose-(glucd C; Species: Escherichia coli C; Date: 04-Mar-1993 #sequence_revision 18-Nov-1994 #text_change 01-Mar-2002 C; Accession: C42982; S47848; E65163 R; Pradel, E.; Parker, C.T.; Schnaitman, C.A. R; Pradel, E.; Parker, C.T.; Schnaitman, C.A. J. Bacteriol. 174, 4736-4745, 1992 A; Title: Structures of the rfaB, rfaI, rfaJ, and rfaS genes of Escherichia coli K-12 and A; Reference number: A42982; MUID:92325066; PMID:1624461
                                                                                                                                                                                                                                                                                                 RESULT 9
C42982
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C95206
c95206
glycosyl transferase, family 8 Sp1770 [imported] - Streptococcus pneumoniae
C;Species: Streptococcus pneumoniae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Authors: Loftus, B.J.; Yang, F.; Smith, H.O.; Venter, J.C.; Dougherty, A;Title: Complete Genome Sequence of a virulent isolate of Streptococcus A;Reference number: A95000; MUID:21357209; PMID:11463916 A;Accession: C95206
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 R;Tettelin, H.; Nelson, K.E.; Paulsen, I.T.; Eisen, J.A.; Read, T.D.; Peterson, S.; Hei on, J.D.; Umayam, L.A.; White, O.; Salzberg, S.L.; Lewis, M.R.; Radune, D.; Holtzapple, nson, T.; Hickey, E.K.; Holt, I.E. Science 293, 498-506, 2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           C;Species: Streptococcus pneumoniae
C;Date: 03-Aug-2001 #sequence_revision 03-Aug-2001 #text_change 03-Aug-2001
C;Accession: C95206
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A;Contents: K-12
A;Accession: C42982
A;Status: preliminary
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: DNA
A; Residues: 1-404 < KUR>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PLYLDRTNTAMPVAVS----HYCGSAKPWHRDCTVWGA 260
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SKKAIEMLKDPEVVQRITHLDQDVLNILLVNKARFVDKKFNTQ-----FSLN-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FKMSCEWVEQYKDVMQ--YQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTD 226
                                                                                                                                                                                                                                                                                                                                                                                                                    VEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLY----L
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LGGNWVGACIDLEVERQEGYKQKIGMADGEY---YFNAGVILINLKKWRRHDIFKMSCEW 175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    KIVD---HVLKKFHLPLKNLSYATFFRYFIPNFVKE-SRALYLDSDIIVTGSLDYLFDIE 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                --YELKDSVINPVDAETVFVHYIGPTKPWHS----WGA
                                                                                                                                                                                                                                                                                                                                                                                          ELKNGDLP-SVIHYTG-VKPWE----IISNNRFREV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TNOYHET-AYGDQGILNMLF-----HDRWKRLDRNFNFMVGMDSVAHIEGNHKWYEIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RFIDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTD 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           IVFNADNDYVDKLETAIKSI--CCYNNCLKFYVFNDDIASEWFLMMNKRLKTIQSEIVNV 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                       266
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                                                                                         glycosyl transferase homolog T10M13.14 - Arabidopsis thaliana C; Species: Arabidopsis thaliana (mouse-ear cress) C; Date: 19-Feb-1999 #sequence_revision 19-Feb-1999 #text_chang C; Accession: T01514 R; Johnson, A.F.; de la Bastide, M.; Lodhi, M.; Hoffman, J.; Ha Martienssen, R.; McCombie, W. submitted to the EMBL Data Library, May 1997 A; Description: The sequence of the Arabidopsis thaliana T10M13 A; Reference number: Z14346 A; Accession: T01514
                                                                                                                                                                                                                                                                                                                           RESULT 10
T01514
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A; Status: translated from A; Molecule type: DNA A; Residues: 1-346 <J

GB/EMBL/DDBJ

#text_change 24-Mar-1999

Hasegawa,

Α.;

Gnoj,

T10M13

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A;Molecule type: DNA
A;Residues: 1-339 <PRA>
A;Cross-references: GB:M80599; GB:M86935; NID:9146650; PIDN:AAA24086.1; PII
- White extracted from NCBI backbone (NCBIN:108180, NCBIP:108185)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Cross references: EMBL:U00039; NID:g466582; PIDN:AAB18604.1; PID:g466765 R;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.; A.; Rose, D.J.; Mau, B.; Shao, Y. Science 277, 1453-1462, 1997 Science 277, 1453-1462, 1997 A;Title: The complete genome sequence of Escherichia coli K-12. A;Reference number: A64720; MUID:97426617; PMID:9278503 A;Accession: E65163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A;Start codon: GTG
C;Superfamily: lipopolysaccharide glucosyltransferase
C;Keywords: glycosyltransferase; hexosyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  A;Cross-references: GB:AE000440; GB:U00096; NID:g2367252; PIDN:AAC76651.1; A;Experimental source: strain K-12, substrain MG1655 C;Genetics:
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                                          284 PPTKCMLQRWRKK
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                                                                                                                                                                                                                                                                                        AIAMLNEPEIIKKITHPDQDVLNMLLADKLIFADIKYNTQFSLNYQLKESFINPVTNDTI 262
                                                                                                                                                                                                    SCEWVEQYKDV--MQYQDQDILNGLFKGGVCYANSRFNF-MPTNYAFMANGFASRHTDPL 228
                                                                                                                                                                                                                                                                   FPDDKVAMVV---TEGQADWWEKRAHSLGVAGIAKG--YFNSGFLLINTAQWAAQQVSAR 202
                                                                                                                                                                                                                                                                                                                                                           IYLINGDRLRSLP-STKNWTHAIYFREVIADYFINKAPKVLYLDADIICQGTIEPLINES 147
                                                                                                                                                                                                                                                                                                                                                                                                                                                  LDIAYGTDKNFLFGCGISIASILKYNEGSRLCFHIFTDYFGDDDRKYFDALALQYKTRIK
KPNNSNQLRYSAK
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                                                                                                                                YLDRTNTAMPVAVSHYCGSAKPWHRDCTVWG-----AERFTELAGSLTTVPEEWRGKLAV 283
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67; Conserv
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314
                                            296
                                                                                      HYIGPTKPWHD----WAWDYPVSQAFMEAKNA---
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Pred. No. 4.5e-09;
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A; Residues: 1-517 <AND>
A; Cross-references: GB:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Title: The genome sequence of Rickettsia prowazekii and the A;Reference number: A71630; MUID:99039499; PMID:9823893 A;Accession: A71707 A;Status: preliminary; nucleic acid sequence not shown; translations preliminary; nucleic acid sequence not shown; translations are sequence of the 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             lipopolysaccharide 1,2-glucosyltransferase (rfaJ) RP476 - Rickettsia prowazekii C;Species: Rickettsia prowazekii C;Species: Rickettsia prowazekii C;Datc: 21-Nov-1998 #sequence_revision 21-Nov-1998 #text_change 03-Nov-2000 C;Accession: A71707 C;Accession: A71707 R;Andersson, S.G.E.; Zomorodipour, A.; Andersson, J.O.; Sicheritz-Ponten, T.; Alsmark, Nature 396, 133-140, 1998
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A; Note: T10M13.14
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A;Experimental source: cultivar Columbia
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les 67; Conserv
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                                                              ASRHTDPLYLDRTNTAMPVAVSHYCGSAKPW-----
                                                                                                                                                                                     KKWRRHDIFKMSCEWVEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGF
                                                                                                                                                                                                                                                                                                              VRDGLKPLWDTDLGGNWVGAC-IDLFV-----ERQEGYKQKIGMADGEYYFNAGVLLINL 160
                                                                                                                                                                                                                                                                                                                                                                             YIRDYSIDFTTFPDNILNKALTYKEIKFSNNWPSLVMYRLYFDKIFPNLDSILYLDADIV
                                                                                                                                                                                                                                                                                                                                                                                                                                        FIDVNPEDFAGFPLNIRHISIT------TYARLKLGEYIADCDKVLYLDTDVL 106
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MDIVFAADDNYAAY-LCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLRGGGNIR 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FMPTNYAFMANGF-----ASRHTDPLYLDRTNTAMPVAVSHYCGSAKPWHR 253
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GVMVIDLKKWRRGGYTKRIEKWMEIQRRERIYE----LGSLPPFLLVFSGHVAPISHRWN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GVLLINLKKWRRHDIFKMSCEWVEQYKDVMQYQDQDILNGL-----FKGGVCYANSRFN 207
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TDVLVRDGLKPLWDTDLGGNWVGA---CIDLFVERQEGYKQKIGMADGEY-----YFNA 153
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ---FNIYDFAPETVRGLISSSVRQALEQPLN-----YARSYLADLLEPCVNRVIYLD 172
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GGNIRFIDVNPEDFAGF------PLNIRHISITTYARLKLGEYIADC-DKVLYLD 102
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VAITLDVEYLRGSIAAVNSILQHSVCPES-VFFHFI--AVSEETNLLESLVRSVFPRLK- 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     IVFAADDNYAAYLCVAAKSV--EAAHPDTEIRFHVLDAGISEENR-----AAVAANLRG
                                                                                                                      KNMREKQYNNILLETLKNSKCDFSFPDQDLLNVAFQNYLYPLSMRWNFC-----
                                                                                                                                                                                                                                                   VLRDLNSLKKIDM-NNYIAACSLDTAITYCIHKVQEECKRNVAHS----YKNSGIVFLNL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -----GPVSLLHWSGSGKPWIR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SDLVVVDDIAKLWKTSLGSRIIGAPEYCHANFTKYFTGGFWSEERFSGTFRGRKPCYFNT 232
TYFEHQSPYFSYFILHY-AEPKPWTTEKEELWKTNHDKLDKITQYYWRYREIT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       11.5%;
26.3%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              11.5%; Score 190; DB 2; 22.0%; Pred. No. 9.4e-09;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 51; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       36; Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NID:g3868717; PIDN:CAA14931.1; PID:g386103
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 114; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 517
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                                                           ----HRDCT 256
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               origin of mitochondria
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511
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 10;
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A;Authors: Salzberg, S.L.; Schwartz, J.R.; Shinn, P.; Southwick, A.M.; Sun, H.; ker, M.; Wu, D.; Yu, G.; Fraser, C.M.; Venter, J.C.; Davis, R.W.
A;Title: Sequence and analysis of chromosome 1 of the plant Arabidopsis.
A;Reference number: A86141; MUID:21016719; PMID:11130712
A;Accession: C86157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       hypothetical protein T14P4.1 - Arabidopsis thaliana (Species: Arabidopsis thaliana (mouse-ear cress) C;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 02-Mar-2001 #sequence_revision 02-Mar-2001 #text_change 31-Dec-2001 C;Accession: C86157 C;Accession: C86157 C;Accession: C86157 C;Accession: C86157 C;Accession: C86157 C;Accession: C,Federspiel; N.A.; Kaul, S.; White, O.; Alon C;Accession: C,Federspiel; N.A.; Creasy, T.H.; Dewar, Chin, C.W.; Chung, M.K.; Conn, C.J.; Federspiel; N.A.; Creasy, T.H.; Dewar, C,F.; Hughes, B.; Hulzar, L. Ansen, N.F.; Hughes, B.; Hulzar, L. Nature 408, 816-820, 2000
                       A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Residues: 1-572 <SAT>
A;Cross-references: EMBL:AL391143
A;Experimental source: cultivar CC
C;Genetics:
                                                                                                                                                                                                                                                                                                        hypothetical protein T20K14_80 - Arabidopsis thaliana (;Species: Arabidopsis thaliana (mouse-ear cress) C;Date: 18-Aug-2000 #sequence_revision 18-Aug-2000 #text_change 18-Aug-2000 C;Accession: T51525 R;Sato, S.; Nakamura, Y.; Kaneko, T.; Kato, T.; Asamizu, E.; Kotani, H.; Tal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
C86157
                                                                                                                                                                                                            R;Sato, S.; Nakamura, Y.;
submitted to the Protein S
A;Reference number: Z25394
A;Accession: T51525
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A; Residues: 1-361 <STO>
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Best Local S
Matches 72
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GSAKPWHR-----DC---TVW
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NGL-----FKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMPVAVSHYC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -YARNYLADLLEPCVKRVIYLDSDLVVVDDIVKLWKTGLGQRTIGAPEYCHANFTKYFTG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FHVLDAGISEENRAAVAANLRGGGNIRFIDVNPEDFAGF-----PLNIRHISIT
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                                                                                                                                                                                                                                                                          ; Kaneko, T.; Kato,
Sequence Database,
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                                                           Columbia;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 186; DB 2;
Pred. No. 1.3e-08;
                                                           BAC clone T20K14
                                                                                                                                                                                                                                                                          T.; Asamizu,
August 2000
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                                                                                                                                                                                                                                                                                                              H.; Tabata,
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[F]

Tallc

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RESULT 14
S47847
A;Start codon: GTG
C;Superfamily: lipopolysaccharide glucosyltransferase I
C;Keywords: glycosyltransferase; hexosyltransferase
                                                                                                                                                                                                                              A;Cross-references: GB:AE000440; GB:U00096; NID:g2367252; PI
A;Experimental source: strain K-12, substrain MG1655
R;Pradel, E.; Parker, C.T.; Schnaitman, C.A.
J. Bacteriol. 174, 4736-4745, 1992
A;Title: Structures of the rfaB, rfaI, rfaJ, and rfaS genes
A;Reference number: A42982; MUID:92325066; PMID:1624461
A;Accession: D42982
                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Molecule type: DNA
A;Residues: 1-338 <PLU>
A;Cross-references: EMBL:U00039; NID:g466582; PIDN:AAB18603.1; PID:g912479
A;Cross-references: EMBL:U00039; NID:g466582; PIDN:AAB18603.1; PID:g912479
A;Blattner, F.R.; Plunkett III, G.; Bloch, C.A.; Perna, N.T.; Burland, V.;
A.; Rose, D.J.; Mau, B.; Shao, Y.
Science 277, 1453-1462, 1997
A;Title: The complete genome sequence of Escherichia coli K-12.
A;Reference number: A64720; MUID:97426617; PMID:9278503
A;Accession: D65163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       lipopolysaccharide glucosyltransferase I (EC 2.4.1.58) - Escherichia coli (strain C;Species: Escherichia coli (c;Species: Escherichia coli (c;Date: 27-Jan-1995 #sequence_revision 27-Jan-1995 #text_change 01-Mar-2002 C;Accession: S47847; D65163; D42982
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A; Residues: 1-338 <BLAT>
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A; Accession: S47847
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               submitted to the EMBL Data Library, March 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R; Plunkett, G.
                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Status: preliminary; nucleic acid sequence not shown; translation not
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                371 HLRIYIPELFPNLDKVVFLDDDIVVQGDLTPLWDVDLGGKVNGA----VETCRGEDEWV 425
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -ISEENRAAVAA------NLRGGGNIRFIDVNPEDFAGFPLNIR---HISITT 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DNILAASVVVSSAVQSSSKPEKIVFHIITDKKTYAGMHSWFALNSVAPAIVEVKGVHQFD 313
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            DNYAAYLCVAAKSVEAAHPDTEIRFHVLD----AG------
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Pred. No. 3.6e-08;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ----AGVLLINLKKWRRHDIFKMSCEWV-EQYKDVM 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Mismatches
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                                                                                                                                                                                                                                                                             of Escherichia coli K-12
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C; Accession: A95206
C; Accession: A95206
R; Tettelin, H.; Nelson, K.E.; Paulsen, I.T.; Eisen, J.A.; Read, T.D.; Peterson, S.; H. on, J.D.; Umayam, L.A.; White, O.; Salzberg, S.L.; Lewis, M.R.; Radune, D.; Holtzappl nson, T.; Hickey, E.K.; Holt, I.E.
Science 293, 498-506, 2001
A; Authors: Loftus, B.J.; Yang, F.; Smith, H.O.; Venter, J.C.; Dougherty, B.A.; Morris A; Authors: Complete Genome Sequence of a virulent isolate of Streptococcus pneumoniae.
A; Paference number: A95000; MUID: 21357209; PMID: 11463916
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C;Species: Streptococcus pneumoniae
C;Date: 03-Aug-2001 #sequence_revision 03-Aug-2001 #text_change 03-Aug-2001
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A;Cross-references: GB:AE005672; PIDN:AAK75842.1; PID:g14973264; GSPDB:GN00164; TIGR:A;Experimental source: strain TIGR4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
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                                                                                                                                                                                                                                                                                                                                                          IVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEE--NRAAVAANLRGGGNIRF 60
                                                                                                                                                                 CLEEKSLAAVKD-----KLKERLIE 158
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CKGDISQLLHLGLNGA-VAAVVKDVEPMQE--KAVSRLSDPELLGQYFNSGVVYLDLKKW
AFNDK----PVVI-HFTTYRKPW---
                                                                               QSIVTMKEVEEGRFEHFNGDQTIFNQVLQDDWLELGRAYNLQVGHDIVALYNNWQEHL--
                                                                                                                        Q----YKDVMQYQ-----DQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDP 227
                                                                                                                                                                                                                                                                                         IDVN-PED--FAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDT 117
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RRHDIFKMSCEWVEQYKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASR 223
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMADGE---YYFNAGVLLINLKKW 163
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 LNVAYGVDANYLDGVGVSITSIVLNNRHINLDFYIIADVYNDGFFQKIAKLAEQNQL---
                                                                                                                                                                                                                                                                                                                                  IVLAGDRNYTRQLETTIKSI--LYHNRDVK\\YILNQDIMPDWFRKPRKIARMLGS---EI 59
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                                                                                                                                                                                                                                                 IDVKLPEQTVFQDWEKQ-DHISSITYARYFIADYIQE-DKVLYLDSDLIVNTSLEKLFSI 117
                                                                                                                                                                                                                                                                                                                                                                                                                  1 Similarity
79; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                    Conservative
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23.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                38;
                                                                                                                                                                                                                                                                                                                                                                                                                Score 179.5; DB Pred. No. 1.4e-078; Mismatches 10
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Pred. No. 4.2e-08;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                       DB 2;
245
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Result
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Maximum DB seq
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 Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                                                                                   536
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Best Local Sir Matches 113; Query Match Best Local :

Similarity

32.3%; Score 536; DB 1; Length 330; 36.9%; Pred. No. 1.1e-40;

Conservative

58;

Mismatches

Indels

26;

Gaps

8

Pfam; PF01501; Glyco_transf_8; 1.

Hypothetical protein; Complete proteome.

SEQUENCE 330 AA; 39073 MW; C5A6CA0207F24F9A CRC64;

EMBL; U32711; AAC21924.1; -. TIGR; HI0258; -.

InterPro;

IPR002495; GT_8.

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ile-genome random sequencing and assembly of Haemophilus influence 269:496-512(1995). SIONS. SIONS. LOOP Clayton R.A., Kerlavage A.R., Fleischmann R.D.; SINTLARITY: TO N.GONORHOEAE LGTC AND WEAK, TO B.SUBTILIS GSPA LIPOPOLYSACCHARIDE 1,3-GALACTOSYLTRANSFERASE (RFAI) AND TO LIPOPOLYSACCHARIDE 1,2-GLUCOSYLTRANSFERASE (RFAJ).	Clayton R.A. Dougherty B.A elds C.A., Go, ek A., Kelley Hedblom E., Saudek D.M. Geoghagen	PRT; 330 AA. ted) sequence update) annotation update) 8. gamma subdivision; Pasteuro	G_LACDL U_EMENI 3_CAEEL _RAT E_AGRRD 0_HAEIN 2_HAEIN 4_PYRAB B_SALTY A_THEMA A_THEMA A_SALTY _SALTY
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                                                                 CHARACTERIZATION, AND SEQUENCE OF 1-28. MEDLINE=95286551; Pubmed=7768864;
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RESULT 3

RFAL_SALTY STANDARD; PRT; 337 AA.

ID RFAL_SALTY STANDARD; PRT; 337 AA.

AC P19916; 068267;
DT 01-FEB-1991 (Rel. 17, Created)
DT 15-JUN-2002 (Rel. 41, Last sequence update)
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MEDLINE=98204873; PubMed=9535865;
Heinrichs D.E., Monteiro M.A., Perry M.B., Whitfield C.;
"The assembly system for the lipopolysaccharide R2 core-type of
Escherichia coli is a hybrid of those found in Escherichia coli
and Salmonella enterica. Structure and function of the R2 WaaK a
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InterPro; IPR002495; GT_8.
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EMBL; X73124; CAA51568.1; -.
EMBL; M29333; AAA75337.1; -.
EMBL; Z99123; CAB15869.1; -.
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SIMILARITY: TO H.IMFLUENZAE HI0259.
SIMILARITY: TO LIPOPOLYSACCHARIDE 1,3-GALACTOSYLTRANSFERASE SIMILARITY:
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33522 MW;
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Pred. No. 2.6e-15;
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EMBL; AE008873; AAL22577.1; -.
EMBL; X53847; CAA37841.1; ALT_FRAME.
EIR; S12097; S12097.
StyGene; SG10337; IfaI.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    werween the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license agreement (See
                                                                                                                                                                                                                                                                 SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Enthe European Bioinformatics Institute. There are no restricted the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Carstenius P., Flock J.-I., Lindberg A.; "Nucleotide sequence of rfaI and rfaJ genes encoding lipopolysaccharide glycosyl transferases from Salmon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       McClelland M., Sanderson K.E., Spieth J., Clifton S.W., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., M Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nha
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                                                                                                                                                                                                                                                                                                                                              InterPro; IPR002495; GT_8.
Pfam; PF01501; Glyco_transf_8;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Ryan E., Sun H., Florea L. Waterston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            typhimurium.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Nature 413:852-856(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     "Complete genome sequence of Salmonella enterica serovar Typhimurium
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OF LPS.

CATALYTIC ACTIVITY: UDP-galactose + lipopolysaccharide = galactosyl-lipopolysaccharide.

PATHWAY: Lipopolysaccharide core biosynthesis.

SIMILARITY: TO E.COLI RFAI AND TO RFAJ.

SIMILARITY: TO E.COLI RFAI AND TO RFAD.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CAUTION: REF.3 AND REF.4 SEQUENCES DIFFER FROM THAT SHOWN
AENEIAAVV----AEGELEWWTKRSVSLATPGLVSG--YFNAGFILINIPLWTAENIS
                                GGNWVGACIDLFVERQEG-----YKQKI-----GMADGEYYFNAGVLLINLKKWRRHDIF 169
                                                                  YLIDCERLKSLP
                                                                                                                            DIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVL-DAGISEENRAAVAANLRGGGNIRF
                                                                                             IDVNPEDFAGFPLNIRHISITTYARLKLGEYIAD-CDKVLYLDTDVLVRDGLKPLWDTDL 119
                                                                                                                                                                                                                                                                                                             proteome.
                                                                                                                                                                                                                                                                 210
337 AA;
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                                                                                                                                                                                              Conservative
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                                                               STKNWTYATYFRFIIADYFSDKTDRVLYLDADIACKGSIQELIDLNF
                                                                                                                                                                                                                                                             125 F
210 E
38905 MW;
                                                                                                                                                                                                                                                                                                                              biosynthesis; Glycosyltransferase;
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                                                                                                                                                                                                              13.2%;
26.7%;
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                                                                                                                                                                                                              Score 219; DB 1;
Pred. No. 2.9e-12;
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-> Q (IN REF. 1).
6DB1FA1531AE25F7 CI
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S., Layman D.,
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RESULT 4
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Best Local
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MEDLINE=9235066; PubMed=1624461;
Pradel E., Parker C.T., Schnaitman C.A.;
"Structures of the rfaB, rfaI, rfaJ, and
"Structures of the rfaB, rfaI, of
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RFAI_ECOLI
P27128;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         01-AUG-1992 (Rel. 23, Created)
01-AUG-1992 (Rel. 23, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
Lipopolysaccharide 1,3-galactosyltransferase
RFAI OR WAAI OR B3627.
                                                                                                                                                                                                             EcoGene; EG11352; rfaI.
InterPro; IPR002495; GT_8.
Pfam; PF01501; Glyco_transf_8; 1.
                                                                                                                                                                                                                                                                         EMBL; M80599; AAA24086.1; -. EMBL; U00039; AAB18604.1; -. EMBL; AE000440; AAC76651.1;
                                                                                                                                                                                                                                                                                                                                                   modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the Exthe European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nucleic Acids Res. 22:2576-2586(1994).
-!- CATALYTIC ACTIVITY: UDP-galactose + lipopolysaccharide
galactosyl-lipopolysaccharide.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sofia H.J., Burland V., Daniels D.L., Plunkett G. "Analysis of the Escherichia coli genome. V. DNA: region from 76.0 to 81.5 minutes.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Bacteria; Proteobacteria; gamma subdivision; Enterobacteriaceae;
                                                                                                                                                                                                                                                                                                                                     or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MEDLINE=94316500; PubMed=8041620;
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                                                                                                                                                                                               Lipopolysaccharide biosynthesis; Glycosyltransferase; Transferase;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM
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C42982; C42982
                                                                          MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAV-AANLRGGGNIR
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                                             LDIAYGTDKNFLFGCGISIASILKYNEGSRLCFHIFTDYFGDDDRKYFDALALQYKTRIK
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                                                                                                        l Similarity
67; Conserv
                                                                                                                                                                               proteome.
                                                                                                                                                                    339 AA;
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                                                                                                                                                                  39423 MW;
                                                                                                                      11.5%;
21.4%;
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                                                                                                                      Score 191; DB 1;
Pred. No. 9.4e-10;
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                                                                                                                                                                    068CA689C1E0C1E0 CRC64;
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                                                                                                                                    Length 339;
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sequence of the
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01-AUG-1992 (Rel. 23, Created)
01-CCT-1994 (Rel. 30, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
15-yoursaccharide 1,2-glucosyltransferase (EC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN=K12;
MEDLINE=92355066; PubMed=1624461;
Pradel E., Parker C.T., Schnaitman C.A.;
"Structures of the rfaB, rfaI, rfaI, and rfaS genes of Escherichia"
"Structures of the rfaB, rfaI, rfaI, and rfaS genes of Escherichia"
                                                                                                                                                                                                                                                                                                                                                                                  This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sofia H.J., Burland V., Daniels D.L., Plunkett G. III, Bl "Analysis of the Escherichia coli genome. V. DNA sequence region from 76.0 to 81.5 minutes.", Nucleic Acids Res. 22:2576-2586(1994).
                                                                                                                                                                                                                     EMBL; M80599; AAA24087.1; -. EMBL; U00039; AAB18603.1; -. EMBL; AE0000440; AAC76650.1; -.
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MEDLINE=94316500; PubMed=8041620;
                                                           Complete
                                                                               InterPro; IPR002495; GT_8.
Pfam; PF01501; Glyco_transf_8; 1.
Lipopolysaccharide biosynthesis; Glycosyltransferase;
                                                                                                                                                                        EcoGene; EG11353;
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PATHWAY: Lipopolysaccharide core biosynthesis.
SIMILARITY: TO S.TYPHIMURIUM RFAJ AND TO RFAI.
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                                                                                                                                                                                                                                                                                                                                                                 McClelland M., Sanderson K.E., Spieth J., Clifton S.W., Latreille P., Courtney L., Porwollik S., Ali J., Dante M., Du F., Hou S., Layman D., Leonard S., Nguyen C., Scott K., Holmes A., Grewal N., Mulvaney E., Ryan E., Sun H., Florea L., Miller W., Stoneking T., Nhan M., Waterston R., Wilson R.K.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WaaL
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                                                                                                                                                                                                      STRAIN-LT2;
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MEDILINE=21534948; PubMed=11677609;
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                                                                            typhimurium.";
                                                                                                                            Carstenius P., Flock J.-I., Lindberg A., Nucleotide sequence of rfal and rfaJ ge
                                                                                                                                                                                                                                                                                       Nature 413:852-856(2001).
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01-NOV-1997
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01-NOV-1997 (Rel. 35, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
UDP-glucose:glycoprotein glucosyltransferase |
(UDP-clc:glycoprotein glucosyltransferase) (direct processes)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                          Drosophila melanogaster (Fruit fly).
Eukaryota; Metazoa; Arthropoda; Mandibulata; Pancrustacea;
Insecta; Pterygota; Neoptera; Endopterygota; Diptera; Bracl
Muscomorpha; Ephydroidea; Drosophilidae; Drosophila.
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EMBL; A5008073; AAL22576.1; -.
EMBL; A53087; CAA37842.1; ALT_FRAME.
PIR; S12098; S12098.
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SUBUNIT: MONOMER.
SUBCELLULAR LOCATION: E
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SIMILARITY: SOME, TO YEAST KRE5, S.TYPHIMURIUM REAJ AND E.COLI
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                                                                                                                                 AAGDRIRGQYQALSQDPNSISNIDQDLPNNM 1443
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                                                                                                                                                        --HDIFKMSCEWVEQYKDVMQYQDQDILNGL 194
                                                                                                                                                                                     YDMDLGGAPYAYTPFCDSRKEMEGFRFWKQGYWRSHLM--GRRYHISALYVVDLKRFRKI 1412
                                                                                                                                                                                                           WDTDLGG---NWVGAC----IDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRR- 165
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38; Conservative
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864
1545
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(Rel. 40, Last sequence update)
(Rel. 41, Last annotation update)
:glycoprotein glucosyltransferase precursor (EC 2.4.1.-)
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N-LINKED (GLCNAC. .) (POTENTIAL).

N-LINKED (GLCNAC. .) (POTENTIAL).
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UDP-glucose

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RA Sgourcs J., Peat N., Hayles J., Baker S., Basham D., Bowman S.,
RA Brooks K., Brown D., Brown S., Chillingworth T., Churcher C.M.,
RA Collins M., Connor R., Cronin A., Davis P., Feltwell T., Fraser A.,
RA Gontles S., Goble A., Hamlin N., Harris D., Hidalgo J., Hodgson G.,
RA Gentles S., Goble A., Hamlin N., Harris D., Hidalgo J., Hodgson G.,
RA Holroyd S., Hornsby T., Howarth S., Huckle E.J., Hunt S., Jagels K.,
RA Holroyd S., Hornsby T., Howarth S., Huckle E.J., Hunt S., Jagels K.,
RA Holroyd S., Hornsby T., Howarth S., Huckle E.J., Hunt S., Jagels K.,
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RA Holroyd S., Hornsby T., Howarth S., Huckle E.J., Hunt S., Jagels K.,
RA Rutherford K., Rutter S., Saunders D., Seeger K., Sharp S.,
RA Rutherford K., Rutter S., Saunders D., Seeger K., Sharp S.,
RA Raylor K., Taylor R.G., Tivey A., Walsh S.V., Warren T., Whitehead S.,
RA Raylor K., Taylor R.G., Tivey A., Walsh S.V., Warren T., Whitehead S.,
RA Woodward J., Volckaert G., Aert R., Robben J., Grymonprez B.,
RA Woltjens I., Vanstreels E., Rieger M., Schaefer M., Mueller S.,
RA Woltjens I., Vanstreels E., Rieger M., Schaefer M., Mueller S.,
RA Borzym K., Langer I., Beck A., Lehrach H., Reinhardt R., Pohl T.M.,
RA Borzym K., Langer I., Beck A., Lehrach H., Reinhardt R., Pohl T.M.,
RA Borzym K., Jang Z., Hunt C., Moore K., Hurst S.M.,
RA Golffeau A., Cadieu E., Dreano S., Gloux S., Lelaure V., Mottler S.,
RA Lucas M., Rochet M., Gaillardin C., Tallada V.A., Garzon A., Thode G.,
RA Lucas M., Rochet M., Gaillardin C., Tallada V.A., Garzon A., Thode G.,
RA Daga R.R., Cruzado L., Jimenez J., Sanchez M., del Rey F., Benito J.,
RA Curutti L., Lowe T., McComble W.R., Paulsen I., Potashkin J.,
RA Shpakovski G.V., Ussery D., Barrell B.G., Nurse P.;
"The genome sequence of Schlzosaccharomyces pombe.";
RN Nature 415:871-880(2002).
                                                                                                                                                                                                                                                                                                                    J. Biol. Chem. 269:30701-30/0b(12)34.

J. Biol. Chem. 269:30701-30/0b(12)34.

FUNCTION: UNFOLDED, DENATURED GLYCOPROTEINS ARE SUBSTANTIALLI ETTER SUBSTRATES FOR GLUCOSYLATION BY THIS ENZYME THAN ARE TORRESPONDING NATIVE PROTEINS. THIS PROTEIN AND TRANSIENT GLUCOSYLATION MAY BE INVOLVED IN MONITORING AND/OR ASSISTING FOLDING AND ASSEMBLY OF NEWLY MADE GLYCOPROTEINS, IN ORDER TO FOLDING AND ASSEMBLY OF NEWLY MADE GLYCOPROTEINS, IN ORDER TO FOLDING TO TOPODROTEINS THAT NEED ASSISTANCE IN FOLDING FROM
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            absence of the enzyme from Saccharomyces cerevisiae.";
J. Biol. Chem. 269:30701-30706(1994).
-I- FUNCTION: UNFOLDED, DENATURED GLYCOPROTEINS ARE SUBSTANTIALLY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Fernandez F.S., Trombetta S.E., Hellman U., Parodi A.J., "Purification to homogeneity of UDP-glucose:glycoprotein glucosyltransferase from Schizosaccharomyces pombe and apparent
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A., SEQUENCE OF 19-33 723-730; 983-990 AND 1118-1130, FUNCT COFACTOR, SUBUNIT, AND GLYCOSYLATION. MEDLINE-96181349; PubMed-8631292;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE FROM N.A., 723-730; 983-990 AN
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        between
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                                                                                                                         PTM: GLYCOSYLATED.
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SWISS-PROT entry is copyright. It is produced through sen the Swiss Institute of Bioinformatics and the EN
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CARBOHYD
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SEQUENCE FROM N.A.
Poster J.
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                                                                                                                                                                                                                                       Saccharomycetales; NCBI_TaxID=4932;
                                                                                                                                                                                                                                                                            Saccharomyces cerevisiae (Baker's yeast).
Eukaryota; Fungi; Ascomycota; Saccharomycotina; Saccharomycetes;
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STRAIN=S288c / AB972;
                                                         Submitted
                                                                                              SEQUENCE FROM N.A.
STRAIN-BF264-15DU;
                                                                                                                                                                                                                                                                                                                                                            Galactosyltransferase MNN10
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Pfam; PF01501; Glyco_transf_8;
                    SEQUENCE FROM N.A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         11 YAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLR------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LLINLKKWRR----HDIFKMSCEWVEQYKDVMQYQDQDILNGL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DVLVRDGLKPLWDTDLGG---NWVGAC----IDLFVERQEGYKQKIGMADGEYYFNAGV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RKQEEKQREIWGYKILFLDVL----FPLELH-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 YERFLYIMTKSV-IEHTDKKVKFWFIENFLSPSFKSSIPAIAKKYNFEYEYITYNWPHWL 1226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            YVVDLDRFRKMGAGDLLRRQYQLLSADPNSLSNLDQDLPNHL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DQIVRADLQELMDMDLHGAPYGYTPMCDSREEMEGFRFWKKGYWKK--FLRGLKYHISAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ------GGGNIRFIDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDT 103
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(Rel. 34, Last sequence update)
(Rel. 41, Last annotation update)
ransferase MNN10 (EC 2.4.1.-) (Bud
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                                                                              Reed
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
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20.7%;
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                                                                                                                                                        Chi J.
to the
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S-> T (IN REF. 1).
T-> A (IN REF. 1).
T-> A (IN REF. 1).
D-> H (IN REF. 1).
S-> C (IN REF. 1).
MISSING (IN REF. 1).
MISSING (IN REF. 1).
                                                         EMBL/GenBank/DDBJ databases
                                                                                                                                                        EMBL/GenBank/DDBJ databases
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Pred. No. v.s:
0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 103.5;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      GLUCOSYLTRANSFERASE.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            219B692FE6BE1966
                                                                                                                                                                                                                                                                                                                                                                                                                                                             393
                                                                                                                                                                                                                                                         Saccharomyces
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Endoplasmic reticulum;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 1;
                                                                                                                                                                                                                                                                                                                                                        emergence delay protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 194
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL).
(POTENTIAL).
(POTENTIAL).
(POTENTIAL).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1260
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Best Local (
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                                                                                                                                                                                         061078;
15-DEC-1998
16-OCT-2001
16-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DOMAIN
CONFLICT
                                           STRAIN=MHOM/BR/86/L669;
Tepe-Lansdell T., Mann B.J.,
Pearson R.D.;
                                                                                                                Eukaryota; Euglenozoa;
NCBI_TaxID=44271;
                                                                                                                                                                                                                                                 _LEICH
TOP2_LEICH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; L42540; AAB48372.1; -. EMBL; U31446; AAC49280.1; -. EMBL; Z49701; CAA89731.1; -. SGD; S0002653; MNN10.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Oliver K., Harris D., Barrell B.G., Rajandream M.A.; Submitted (MAY-1995) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: PUTATIVE GALACTOSYLTRANSFERASE REQUIRED FOR
 (Leishmania) chagasi.
Submitted (NOV-1999)
                   "Isolation of a gene encoding a DNA topoisomerase II (Leishmania) chaqasi.";
                                                                                      SEQUENCE FROM N.A
                                                                                                                                                                         DNA topoisomerase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Golgi stack.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Transferase; Glycosyltransferase; Transmembrane; Signal-anchor;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TRANSMEM
                                                                                                                                              Leishmania chagasi.
                                                                                                                                                                                                                                                                                                                                                      239
                                                                                                                                                                                                                                                                                                                                                                                                                                           240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   180
                                                                                                                                                                                                                                                                                                                        335 GACSEYSGDSRYFYSEKDHDFVVNMAGCNFGRDC--WGEMQY-----YTTLMEKLNRK
                                                                                                                                                                                                                                                                                                                                                                                   295
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          126 LAAN-EGGGVLRW--KNEQEWAIEGISIENKKAYAKRHGYALTIK--DLTTSKRYS-HEY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     48 VAANLRGGGNIRFIDVNPEDFA----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GROWTH AND EFFICIENT BUDDING.
SUBCELLULAR LOCATION: Type II membrane protein. Golgi (Potential).
SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 34.
                                                                                                                                                                                                                                                                                                                                                   VAVSHYCGSAKPWH-----
                                                                                                                                                                                                                                                                                                                                                                                KHMVWEHREQDALEALYENEP-WIRSRIGFLP-
                                                                                                                                                                                                                                                                                                                                                                                                          YKDVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMP 238
                                                                                                                                                                                                                                                                                                                                                                                                                                        LNLRDDIPYVDYSEEMEFLITQDCGG--FNLGSFLIKNSEWSK---LLLDMWWDPVLYEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VGACIDL-FVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEW----VEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  REGWQKVDILRQTFREFPNAEWFWWLDLDTMIMEPSKSLEEHIFDRLETLADRELKSFNP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             67;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            393
                                                                                                                                                                     (Rel. 37, Created)
(Rel. 40, Last sequence update)
(Rel. 40, Last annotation update)
merase II (EC 5.99.1.3).
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238
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                                                                                                                                                                                                                                                  STANDARD;
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238
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                                                                                                                               Kinetoplastida; Trypanosomatidae;
   the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            W.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  38;
                                                                                                                                                                                                                                                                                                                                                   EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LUMENAL (POTENTIAL).
N -> I (IN REF. 2).
                                                        Labombard M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 94.5;
Pred. No. 0.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SIGNAL-ANCHOR (TYPE-II MEMBRANE PROTEIN)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    CYTOPLASMIC (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (POTENTIAL)
                                                                                                                                                                                                                                                 PRT;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    -GFPLNIRHISITTYARLKLGEY 91
                                                         Macdonald
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; 68
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 393;
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                                                         Η.,
                                                                                                                                                                                                                                                                                                                                                                                -LRTINAFPP
                                                                                                                               Leishmania
                                                         Slunt K.M.,
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RESULT 11
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Matches
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ACT_SITE
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ProDom; PD000616; DNA_topoisoII; ProDom; PD000742; DNA_topoisoIV; SMART; SM00387; HAFPase_c; 1. SMART; SM00433; TOP2c; 1. SMART; SM00434; TOP4c; 1.
                                                                                             1093
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Pfam; PF00521; DNA_topoisoIV; 1. Pfam; PF02518; HATPase_C; 1. PRINTS; PR00418; TPI2FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; AF051307; AAC05295.2; -. HSSP; P06786; 1BGW.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              modified and this statement is not removed entities requires a license agreement (See or send an email to license@isb-sib.ch).
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                                                                                                                                                          1039
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Pfam; PF00204; DNA_gyraseB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROSITE;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    InterPro;
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                                                                                                                         247
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FUNCTION: CONTROL OF TOPOLOGICAL STATES OF DNA BY TRANSIENT BREAKAGE AND SUBSEQUENT REJOINING OF DNA STRANDS. TOPOISOMERASE II MAKES DOUBLE-STRAND BEEAKS.

CATALYTIC ACTIVITY: ATP-dependent breakage, passage and rejoining of double-stranded DNA.

Of double-stranded DNA.

SUBUNIT: HOMODIMER (BY SIMILARITY).

SUBCELLULAR LOCATION: Nuclear (By similarity).

SUBCELLULAR LOCATION: TOPOISOMERASE I AND II CAN RELAX BOTH MISCELLANEOUS: EUKARYOTIC TOPOISOMERASE I AND II CAN RELAX BOTH
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NEGATIVE AND POSITIVE SUPERCOILS, WHEREAS PROKARYOTIC EN RELAX ONLY NEGATIVE SUPERCOILS.
SIMILARITY: BELONGS TO THE TYPE II TOPOISOMERASE FAMILY.
                                                                                                                           SAKPW
                                                                                             PVKMW
                                                                                                                                                                                        ILNGLEKGGVCYANSRENEM----PTNYAFMANGFASRHTDPLYLDRTNTAMPVAVSHYCG
                                                                                                                                                                                                                                                   DVLVRDGLKPLW---DTDLGGNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVL----
                                                                                                                                                                                                                                                                                                                                                 NEFIAVG--KYTAHPNGRFHISEIPWMTSIEAFRLHISSLASADVVQRIADYSGANHIDI 936
                                                                                                                                                                                                                                                                                                                                                                               IRFIDVNPEDFAGFPLNIRHIS------ITTYARLKLGEYIADCDKVLYLDT 103
                                                                                                                                                                                                                                                                                                                                                                                                              LCNGAVGIGFGFATTIPSFHPLDVSAAVRAMINGESAKQVVRNLVPWAVGFQGTVRRGPD
                                                                                                                                                                                                                                                                                                                                                                                                                                              LCVAAKSVEAAHPDTEIRFHVLD-----AGISEENRAAVAANL------RGGGN 57
                                                                                                                                                         LHKTCVKLGLVRVDESFDYILKKPITF-----FTRTSTEKLQADIAKTQAQIEELKRTT 1092
                                                                                                                                                                                                                      SDLSPVLQWHYDRRLDLYKRRRTRKIGLMKMDLARLQSTRKFVEHFRQGQIDFLNATDDT
                                                                                                                                                                                                                                                                                   DLIVRDGSLTTWAECETDL--------ALAQRI-YINGTVFSPTGTLSPID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PS00177; TOPOISOMERASE_II; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IPR001241; DNA_topoisoII. IPR002205; DNA_topoisoIV.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 IPR003594; ATPbind_ATPase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            775 7
1236 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Topoisomerase; ATP-binding 137 142 ATP (POT 775 775 DNA CLEAN
                                                                                               1097
                                                                                                                           251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            138968 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 93;
Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ATP (POTENTIAL).
DNA CLEAVAGE (BY SIMILARITY).
MW; A3209B95A078045C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Mismatches
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             111;
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Best Local :
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01-AUG-1991
15-JUN-2002
                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collable between the Swiss Institute of Bioinformatics and the EMBL outsit the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for conmodified and this statement is not removed.
                                                                                                                                                                                                                                                                    EMBL; M38416; AAA98417.1; -. EMBL; X57400; CAA40656.1; -. PIR; S15193; S15193.
                                                                                                                                                           Transport; Sugar transport; Outer membrane; Signal; Plasmid; 3D-structure.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Forst D., Weite W., Wacker T., Diederichs "Structure of the sucrose-specific porin typhimurium and its complex with sucrose." Nat. Struct. Biol. 5:37-46(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A.
MEDLINE-91312133; Pul
Schmid K., Ebner R.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hardesty C., Ferran C., Dirienzo J.M.;
"Plasmid mediated sucrose metabolism in Escherichia coli:
characterization of scry, the structural gene for a
phosphoenolpyruvate-dependent sucrose phosphotransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Salmonella typhimurium. Plasmid pur400.
                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "A sugar-specific porin, enteric bacteria.";
                                                                                                                                                                                                InterPro; IPR003192; Po:
Pfam; PF02264; LamB; 1.
                                                                                                                                                                                                                                                                                                                        or send
                                                                                                                                                                                                                                                                                                                                   entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   -!- FUNCTION: Porin for sucrose uptake-!- SUBUNIT: HOMOTRIMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=98100081; PubMed=9437428;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           X-RAY CRYSTALLOGRAPHY (2.4 ANGSTROMS).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              outer membrane porin.";
J. Bacteriol. 173:449-456(1991).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=91100329; PubMed=1846143;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN=6153-62;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NCBI_TaxID=602;
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  19
                                                     13
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                                                                                                                                                                                                                            ; S15193; S15193.
; A39127; A39127.
; 1A0S; 10-JUN-98.
; 1A0T; 18-MAR-98.
                                                                                                                                                                                                                                                                                                                                                                                                                             SIMILARITY: BELONGS TO THE LAMB FAMILY OF PORINS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    SUBCELLULAR LOCATION: Integral membrane protein. DOMAIN: THE C-TERMINUS HELPS TO ANCHOR THE PORIN
                                                    AYLCVAAKSVEAAHPDTEI ----- RFHYLDAGISE - ENRAAVAANLRGGGNIRF -----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Microbiol.
                          AMLIALLTSAASAHAQTDISTIEARLNALEKRLQEAENRAQTAENRAGAAEKKVQQLTAQ
                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                       an email to license@isb-sib.ch).
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                                                                                                                                    505 AA;
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(Rel. 19, Last seq
(Rel. 41, Last ann
                                                                               Conservative
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55467 MW;
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19.3%;
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                                                                                                                                                                                                                  Porin_LamB
IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDT 103
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Pred.
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                                                                               Mismatches
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SCrY
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Y635_METJA
                                                                                                                                                                                                       Query Match
Best Local :
                                                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     STRAIN-JAL-1 / DSM 2661 / ATCC 43067;

MEDLINE-96337999; pubMed-8688087;

Bult C.J., White O., Olsen G.J., Zhou L., Fleischmann R.D.,

Button G.G., Blake J.A., FitzGerald L.M., Clayton R.A., Gocayne J.D.,

Kerlavage A.R., Dougherty B.A., Tomb J.-F., Adams M.D., ReLch C.I.,

Overbeek R., Kirkness E.F., Weinstock K.G., Merrick J.M., Glodek A.,

Scott J.L., Geoghagen N.S.M., Weidman J.F., Fuhrmann J.L., Nguyen D.,

Utterback T.R., Kelley J.M., Peterson J.D., Sadow P.W., Hanna M.C.,

Cotton M.D., Roberts K.M., Hurst M.A., Kaine B.P., Borodovsky M.,

Klenk H.-P., Fraser C.M., Smith H.O., Woese C.R., Venter J.C.;

"Complete genome sequence of the methanogenic archaeon, Methanococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Y635_METJA
Q58052;
                                                                                                                                                                                                                                                   Hypothetical protein; Complete proteome. SEQUENCE 283 AA; 32502 MW; 1CE52FC8457C5E20 CRC64;
                                                                                                                                                                                                                                                                                                                               use by non-profit institutions as long as its content is modified and this statement is not removed. Usage by and fo entities requires a license agreement (See http://www.isb-sib.or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Methanococcus jannaschii.
Archaea; Euryarchaeota; Methanococci; Metl
Methanocaldococcaceae; Methanocaldococcus
                                                                                                                                                                                                                                                                                                                                                                                            between the Swiss Institute of Bioinf
the European Bioinformatics Institute
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-NOV-1997
16-OCT-2001
                                                                                                                                                                                                                                                                                       TIGR;
                                                                                                                                                                                                                                                                                                      EMBL; U67511;
                                                                                                                                                                                                                                                                                                                                                                                                                                This
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Science
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            "Complete genome jannaschii.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A
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163
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                                                                                                                                                         NYAAYLCVAAKSVEAAHPDTEIRFHVLDA---GISEENRAAVAAN-----LRGGGNIRF
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                           IADCDKYLYLDTDYLVRD-GLKPLWD---TDLGGNWVGACI-DLFVERQEGYKQKIGMAD 146
                                                                                                                         DYNGFYYVNFKNIEDSKYSSEYRSKILNALRLGNANGEKTGIYINKTKRMIFSGSGYDRF
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--DCINVINGEMDSLLKNREVMEIYDRLPSD---
                                                            VIIIEGDYDFDKFKNHLKEIGVNPVEEYGGFKIYTKPNDDKIALTFYKDMIIAGTKQGVY
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                                                                                                                                                                                                                                                                                       MJ0635;
                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                              273:1058-1073(1996).
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35, Last sequence update)
40, Last annotation updat
                                                                                                                                                                                                        5.3%;
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Pred.
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No. 1.3;
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ACVYEVSGTYSPWYKT --
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-VAE
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Db Qy

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GMSISFENNDRVKVVRVEKYKDEETAK ----EKYEELLKKKDRD

-EYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYKDVMQYQDQD

189 250

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Best Local 9
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-!- FUNCTION: STRUCTURAL RIGIDITY OF THE OUTER MEMBRANE OF ELEMENTARY
-!- BODIES AND PORIN FORMING, PERMITTING DIFFUSION OF SOLUTES THROUGH
THE INFRACELLULAR RETICULATE BODY MEMBRANE.
-!- SUBUNIT: DISULFIDE BOND INTERACTIONS WITHIN AND BETWEEN MOMP
MOLECULES & OTHER COMPONENTS FORM HIGH MOLECULAR-WEIGHT OLIGOMERS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CHLTR
                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                CHAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                        Pfam; PF01308; Chlamydia_OMP; 1.
PRINTS; PR01334; CHLAMYDIAOMP; 1.
ProDom; PD001717; Chlamydia_OMP; 1.
Outer_membrane; Transmembrane; Porin; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PIR; S11010; MMCWTB.
InterPro; IPR000604; Chlamydia_OMP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; M17342; -; NOT_ANNOTATED_CDS.
EMBL; AF304856; AAG41414.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     modified
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                "Sequence analysis of the major outer membrane protein gene Chlamydia trachomatis.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-B/TW-5/OT;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A. MEDLINE=87307955;
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Bacteria; Chlamydiales; Chlamydiaceae; Chlamydia
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OMPA OR OMP1B
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01-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             OM1B_CHLTR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               genes."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NCBI_TaxID=813;
150 YFNAGVLLINLKKWRRHDIFKMSCEWVEQYKDVMQYQDQDILNGLFKGGVC---
                                                           65
                                                                                                        92
                                                                                                                                                           10
                                                                                                                                                                                                               48
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteriol. 169:3879-3885(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SUBCELLULAR LOCATION: Integral membrane protein. Outer membrane. SIMILARITY: BELONGS TO THE CHLAMYDIAL OMP FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SUBCELLULAR LOCATION:
                                                   YGDFVFDRVLKTDVNKEFQMGAKP---TTTTGNAV-APSTLTARENPAYGRH--MQDAEM 118
                                                                                                                                                                                                            VAANLRGGGNIRFIDV-NP------EDFAGFPLNIRHISITTYA---RLKLGEY 91
                                                                                                      IAD--CDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGMADGEY 149
                                                                                                                                                         VFAALSSASSLQALPVGNPAEPSLMIDGILWEGFGGDPCD----PCTTWVDAISMRMG-Y 64
                                                                                                                                                                                                                                                                                          Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and this statement is not removed. requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           non-profit institutions as long
                                                                                                                                                                                                                                                                                                                                                                     394 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (Rel. 20, (Rel. 40,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 membrane protein, serovar B precu.
B.
                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                                                                                                                23
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                                                                                                                                                                                                                                                                                                                                                                     42528 MW;
                                                                                                                                                                                                                                                                                       5.3%;
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                                                                                                                                                                                                                                                          26; Mismatches
                                                                                                                                                                                                                                                                                          Score 87; Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                           MAJOR OUTER MEMBRANE PROTEIN,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                     C364233145A69301 CRC64;
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major
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   There are no restrictions ong as its content is in
                                                                                                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         precursor (MOMP).
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outer
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Usage
                                                                                                                                                                                                                                                               93;
                                                                                                                                                                                                                                                                                                             Length 394;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Inouye C.
                                                                                                                                                                                                                                                            Indels
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ne protein
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                                                                                                                                                                                                                                                               <u>,</u>09
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  -YA 202
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DPOM_ASCIM
                                                                                                                                                                                           Matches
                                                                                                                                                                                                                      Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 01-AUG-1991 (Rel. 19, Create 01-AUG-1991 (Rel. 19, Last s 15-DEC-1998 (Rel. 37, Last a Probable DNA polymerase (EC
1067
                                                                                                                                                                                                                                                                                                                    InterPro; IPR004868; DNA_pol_B_2.
pfam; PF03175; DNA_pol_B_2; 1.
SMART; SM00486; POLBC; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DPOM_ASCIM
P22374;
                                                                                                                                                                                                                                                     Transferase; DNA-directed DNA polymerase; DNA replication; DNA-binding; Plasmid; Mitochondrion.
SEQUENCE 1202 AA; 138279 MW; 51D41FCEBDBF2CDE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                  entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          extrachromosomal DNA of the ascomycete Ascobolus immersus."; Mol. Gen. Genet. 218:523-530(1989).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         STRAIN-2/I;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Eukaryota; Fungi; Ascomycota; Pezizomycotina; Pezizomycetes;
Pezizales; Ascobolaceae; Ascobolus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Plasmid pAI2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mitochondrion.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ascobolus immersus.
                                                                                                                                                                                                                                                                                                     PROSITE;
                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR002064; DNA_pol_B
                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; X15982; CAA34106.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           -I- MISCELLANEOUS: THIS DNA POLYMERASE REQUIRES A PROTEIN AS A PRIMER

    -i- CATALYTIC ACTIVITY: N deoxynucleoside triphosphate - N diphosphate

                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         "In organello replication and viral affinity of linear,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Kempken F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=90066356;
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                               145
                                                                                                                            967
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  161
                                                                                            86
                                                                                                                                                            31
                                                                                                                                                                                                          Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SIMILARITY: BELONGS TO DNA POLYMERASE TYPE-B FAMILY. STRONG, TO DNA POLYMERASE OF OTHER FUNGAL AND PLANTS MITOCHONDRIAL PLASMIDS.
                             ADGEYYFNAGVL---
                                                                                                                                                                                                                                                                                                                                                                                     S05362;
MKHEYTFKEAVFVAPKVYGGLFDKPYKNKVEIVK-----VKGLKEPIQYSD
                                                                                           LKLGEY-IADCDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGACIDLFVERQEGYKQKIGM 144
                                                                                                                          IKYSVLTPEESEEKLKNSSCIEATTLPSGNVLFKENKPLGEFSNLNTSVPISAAIAAYSR 1026
                                                                                                                                                        IRFHYLDAGISEE----NRAAVAANLRGGGNIRFIDVNP-EDFAGFPLNIR-HISITTYAR 85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (BY SIMILARITY)
                                                               MIMSEYLIKYADNLYAVDT----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMPVAVSHYCGSAKPWHRDCTVWGA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            [DNA] (N)
                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                    PS00116; DNA_POLYMERASE_B; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Meinhardt F.,
                                                                                                                                                                                         Conservative
                                                                                                                                                                                                                                                                                                                                                                                     S05362.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         19, Created)
19, Last sequence update)
. 37, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        PubMed=2573821;
ardt F., Esser K.;
                             -----LINLKKWRRHDIFKMSCEWVEQYKDVMQYQD
                                                                                                                                                                                                        5.2%;
22.8%;
                                                                                                                                                                                         32;
                                                                                                                                                                                                       Score 86.5;
Pred. No. 1
                                                                                                                                                                                         Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1202
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                                                                                                                                                                                                                       DB 1;
                                                                                                                                                                                         61;
                                                             -VDTEIDKKYVSDKELGL 1066
                                                                                                                                                                                                                       Length 1202;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  restrictions
tent is in
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1112
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   a collaboration
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   for commercial
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                                                                                                                                                                                      Gaps
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EMBL; AF040747; AAC09268.1; -.
EMBL; AF040748; AAC09270.1; -.
EMBL; Y17967; CAA76975.1; -.
EMBL; Y17967; CAA76975.1; -.
EMBL; Y17967; CAA75789.1; -.
EMBL; Y17998; CAA75789.1; -.
EMBL; Y15799; CAA75789.1; -.
EMBL; Y15799; CAA75780.1; -.
HSSP; Q63450; 1A06.
MGD; MGI:1347078; Gprk6.
InterPro; IPR000719; Euk_pkinase.
InterPro; IPR000342; Regl_Gprotein.
                                                                      PRINTS; PRO0717; GPCRKINASE.
ProDom; PD000001; Euk_pkinase; 1
SMART; SM00315; RGS; 1.
SMART; SM00313; S_TK_X; 1.
SMART; SM00133; S_TK_X; 1.
SMART; SM001020; S_TKC; 1.
PROSITE; PS00107; PROTEIN_KINASE
PROSITE; PS00108; PROTEIN_KINASE
PROSITE; PS00108; PROTEIN_KINASE
PROSITE; PROOFEIN_KINASE_ATP; 1.

PROSITE; PSO0101; PROTEIN_KINASE_DOM; 1.

PROSITE; PS00108; PROTEIN_KINASE_ST; 1.

PROSITE; PS0012; RGS; 1.

Transferase; Serine/threonine-protein kinase; ATP-binding; Phosphorylation; Lipoprotein; Palmitate; Alternative splicing.

DOMAIN 1 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content modified and this statement is not removed. Usage by and entitles requires a license agreement (See http://www.isb-sorsend an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Submitted (SEP-1998) to the EMBL/GenBank/DDBJ databases.
-!- FUNCTION: SPECIFICALLY PHOSPHORYLATES THE ACTIVATED |
PROTEIN-COUPLED RECEPTORS (BY SIMILARITY).
-!- SUBCELLULAR LOCATION: Membrane-bound.
-!- ALTERNATIVE PRODUCTS: 2 ISOFORMS; GRK6A (SHOWN HERE)
ARE PRODUCED BY ALTERNATIVE SPLICING.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    070293; 070294;
30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
G protein-coupled receptor kinase GRK6 (EC 2.7.1.-) (G-protein-coupled
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        STRAIN=129/SvJ, and C57BL/6J; TISSUE-Thymus; Moepps B., Vatter P., Frode R., Waechter F., Gierschik P.; "Primary Structure of murine G-protein-coupled receptor ki splice variants predict differential regulation by posttra modifications.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Premont R.T., Lefkowitz R.J.;

"Genomic organization of the GRK5 and GRK6 genes:

"Genomic organization of the GRK4 subfamily of g protein-coupled rece

evolution of the GRK gene family.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          receptor kinase 6). GPRK6 OR GRK6.
                                                                                                                                                                                                                  Pfam; PF00069; pkinase; Pfam; PF00615; RGS; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mus musculus (Mouse).
Eukaryota; Metazoa; Chordata;
Mammalia; Eutheria; Rodentia;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     NCBI_TaxID=10090;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SIMILARITY: BELONGS TO THE SER/THR FAMILY OF PROTEIN KINASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GPRK SUBFAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOUSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (JAN-1998) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (ISOFORMS GRK6A AND GRK6B).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (ISOFORMS GRK6A AND
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Craniata; Vertebrata;
Sciurognathi; Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 GRK6B).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 conserved structure
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Euteleostomi;
; Murinae; Mus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                restrictions
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                                                                                      EVAEEYTDRFSSQARSLCSQLLSKDPAERLGCRGGGAREVKEHPLFKKLNFKRLGAGMLE
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                                                                                                                                                                                                 EYIAD-CDKVLYLDTDVLVRDGLKP---LWD-----TDLGGNWVGACIDLFVERQEGY 138
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                     FTEL--AGSLTTVPE--EWRGKLAVPPTKCMLQR 292
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                                                                                                            EWVEQYKDVMQYQDQDILNGLFK-----
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                                                                                                                                                       KQKIG-----MADGEYYFN----AGVLLINL-----
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PALMITATE (BY SIMILARITY).
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PHOSPHORYLATION (AUTO-)
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ATP (BY SIMILARITY).
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SIMILARITY).
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earch completed: December 2, 2002, 11:56:27 bb time: 8.44739 secs

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Result
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Maximum DB
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Perfect score:
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Maximum Match 100%
Listing first 45 summaries
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O9clsO pasteurella
O9rsO neisseria g
O9rgnO neisseria g
O9l7a2 haemophilus
O9ahb5 streptococc
O48480 klebsiella
O8vu29 streptococc
O97p76 streptococc
O97p77 streptococc
O97p77 streptococc
O97p77 streptococc
O97p77 streptococc
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Q9rex5 neisseria g
P96945 neisseria m
Q96847 neisseria m
Q916b2 pasteurella
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168	169.5	170	171	171.5	171.5	176.5	177	177	179.5	183	184	186	187	189	190	190.5	193	194	197.5	201.5	210	212.5	216.5					220
10.1	10.2	10.3	10.3	10.4	10.4	10.7	٠	10.7		11.0	11.1	11.2	11.3	11.4	:	11.5		11.7	11.9		12.7			13.1	•	13.2	13.2	13.3
336	351	337	682	361	357	696	337	329	814	510	572	361	338	339	517	346	331	331	309	404	337	341	338	338	342	635	273	335
16	10	16	N	10	10	16	16	N	16	10	10	10			16			N			16		N	N	N	N	N	16
Q8Z2G2	Q9M8J2	Q92VQ2	Q9AEU2	Q8VYF4	Q9LZJ9	Q97P72	Q8XDC2	Q9ZNA6	Q97P75	Q9MAB8	Q9LF35	Q9FWY9	068204	068205	Q9ZD68	004253	Q9ZIS6	Q9R9D2	Q52832	Q97P73	Q8Z2G3	Q9ZIS8	Q9ZIS5	Q9R9D1	Q9ZIS1	Q48484	Q93RH6	Q8XDC0
Q8z2g2 salmonella	Q9m8j2 arabidopsis	Q92vq2 rhizobium m					Q8xdc2 escherichia	o				Q9fwy9 arabidopsis	O68204 escherichia	O68205 escherichia		004253 arabidopsis	Q9zis6 escherichia	Q9r9d2 escherichia		Q97p73 streptococc	Q8z2g3 salmonella	Q9zis8 escherichia	Q9zis5 escherichia	Q9r9d1 escherichia	Q9zis1 escherichia		Q93rh6 streptococc	Q8xdc0 escherichia

ALIGNMENTS

Qy 121 GNWVGACIDLEVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYK 180	Db 61 IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLG 120	Qy 61 IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLG 120	Db 1 MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLRGGGNIRF 60	Qy 1 MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLRGGGNIRF 60	Query Match 100.0%; Score 1657; DB 2; Length 306; Best Local Similarity 100.0%; Pred. No. 9.4e-142; Matches 306; Conservative 0; Mismatches 0; Indels 0; Gaps 0;	UN FIGHT; FRUIDUI; GIYCO_CIGHSL_0; I. KW Transferase.	InterPro; IPR002495; GT_8.		Neisseria gonorrhoeae lipooligosaccharide.":	RA Gotschlich E.C.; PudMed=/964493;		NCBI_TaxID=485;	Oo Netsysetta gonoffiloeae.		01-MAR-2002 (TrEMBLrel. 20,	01-NOV-1996 (TrEMBLrel, 01,	1996 (TrEMBLrel.	AC OSOALS. PRELIMINARY; PRE; 300 AA.	0948	RESULT 1

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RESULT
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gonococci.";
Submitted (NOV-1999) to the EMBL
EMBL; AF208062; AAF20991.1;
InterPro; IPR002495; GT_8.
Pfam; PF01501; G1yco_transf_8; 1
SEQUENCE 307 AA; 34903 MW; 0
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Q9REX5;
01-MAY-2000
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01-MAR-2002
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P96945;
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Balthazar J.T.,
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Bacteria; Proteobacteria;
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Pred. No. 1.9e-139;
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Glycosyl transferase.
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Bacteria;
MEDIJINE-21467954; PubMed=11583844; Zhu P., Klutch M.J., Tsai C.-M.; "Sai C.-M.; "Genetic Analysis of Conservation and Variation of Lipooligosaccharide Expression in Two L8-Immunotype Strains of Neisseria meningitidis."; FEMS Microbiol. Lett. 203:173-177(2001).
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Bacteria; Proteobacteria;
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                                                                                                                                    SEQUENCE FROM N.A.
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Best Local
                                                                                                                                                                                                      "Identification of Pasteurella multocida virulence genes in septicemic mouse model using signature-tagged mutagenesis.", submitted (FEB-2000) to the EMBL/GenBank/DDBJ databases. EMBL; AF237927; AAF68413.1; -. InterPro; IPR002495; GT. InterPro; IPR002495; GT. B. Pfam; PF01501; Gluco the EMBL/GenBank/DDBJ databases.
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01-OCT-2000
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Pfam; PF01501; Glyco_transf_8;
SEQUENCE 311 AA; 35738 MW;
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                                                                                                                                     121;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GGNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQY 179
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LGGNWVGACIDLEVERQEG-YKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVE 177
                                                         FIDVNPEDFAGFPLNIRHISITTYARLKLGEYIAD-CDKVLYLDTDVLVRDGLKPLWDTD 118
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                                             FIAVNEKEFESFPVQISYISLATYARLKAAEYLPDNLNKIIYLDVDVLVFNSLEMLWNVD
                                                                                         MNILFVSDDVYAKHLVVAIKSI-INHNEKGISFYIFDLGIKDENKRNINDIVSSYGSEVN
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93.9%;
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                                                                                                                                    Score 572; DB 2;
Pred. No. 1.4e~43;
1; Mismatches 115
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Pred. No. 4.2e-132;
2; Mismatches 12;
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                                                                                                                                                                                 C987BB3F77FBB158 CRC64;
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A6EDE3F85ACC5B5D CRC64;
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Q9CLS0;
01-JUN-2001
01-JUN-2001
01-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        May B.J., Zhang Q., Li L.L., Paustian M.L., Whittam T.:
"Complete genomic sequence of Pasteurella multocida Pm
Proc. Natl. Acad. Sci. U.S.A. 98:3460-3465(2001).

EMBL; AE006155; AAK03223.1; -.

InterPro; IPR002495; GT_8.

Pfam; PF01501; Glyco_transf_8; 1.

Hypothetical protein; Complete proteome.

SEQUENCE 302 AA; 35716 MW; 6C7264ED8F033C00 CRC64;
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Bacteria; Proteobacteria;
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May B.J., Zhang Q., Li L.L., Paust
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Local Similarity 38.9%;
les 121; Conservative 6:
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Pred. No. 1.4e-43;
1; Mismatches 115
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PRT;

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AC Q9
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Matches 5
                   Q9L7A2
Q9L7A2;
Q9L7CT-2000
Q1-OCT-2000
Q1-MAR-2002
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Q9RGNO;
01-MAY-2000
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01-MAY-2000
01-JUN-2002
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Pfam; PF0
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Bacteria;
                                                                                                                                                                                                                              MEDLINE=20305049; PubMed=10844691; Harvey H.A., Porat N., Campbell C.A., Phillips N.J., Apicella M.A., Balke M "Gonococcal lipooligosaccharide is a receptor on human sperm.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN=FA19;
Balthazar J.T., Sh
"Mutations in the
           Putative glycosyl
                                                                                                                                                                            SEQUENCE
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                                                                                                                                                                                     Transferase
                                                                                                                                                                                           InterPro; IPR002495; GT_8.
Pfam; PF01501; Glyco_transf_8; 1.
                                                                                                                                                                                                                                                                             STRAIN=1291;
                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                       NCBI_TaxID=485;
                                                                                                                                                                                                                                                                                                                 Bacteria;
                                                                                                                                                                                                                                                                                                                         Neisseria
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MBL; AF208061; AAF20990.1; -.
nterPro; IPR002495; GT_8.
fam; PF01501; Glyco_transf_8;
EQUENCE 57 AA; 5934 MW; 39
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RESULT 10
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Best Local S
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Q9AHB5;
Q1-JUN-2001
Q1-JUN-2001
Q1-JUN-2002
Q1-JUN-2002
                                                                                   cpsE and c
Submitted
[3]
                                                                                                                                                                                                                                                             Jiang S.M., Wang L., Reeves P.R.;
"Molecular characterization of Streptococcus
and 18C capsular polysaccharide gene clusters
Infect. Immun. 69:1244-1255(2001).
                                                                                                                                                                                                                                                                                                                                                                                                                                                          Streptococcus pneumoniae.
Bacteria; Firmicutes; Bacillus/Clostridium
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-JUN-2001 (TrEMBLrel. 17, Last sequence update)
01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
WCiN (CpsP) (Putative galactosyl transferase) (Putative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Wang J., Hanson E., Munson R.S. Jr.;
"Putative glycosyl transferase.";
submitted (JAN-2000) to the EMBL/Gen!
EMBL; AF224467; AAF28363.1;
InterPro; IPR002495; GT_8.
"Pfam; PF01501; Glyco_transf_8; 1.
                                    SEQUENCE FROM N.A. STRAIN=SSISP 6A/1;
                                                                                                        "The Cps locus of Streptococcus cpsE and cpsL."; Submitted (AUG-2000) to the EMBI
                                                                                                                                                                                              SEQUENCE FROM N.A. STRAIN-PN93/1413;
                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A. MEDLINE=21116929; PubMed=11179285;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     transferase Cps6aP).
WCIN OR CPSP OR CPS6AP.
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NCBI_TaxID=730;
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Bacteria; Proteobacteria;
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No. 2.9e-16;
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Griffiths "The Capsu

fiths D.B., Hall L.M.C.; Capsular Polysaccharide

Locus

of Streptococcus

pneumoniae

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RESULT 11
Q48480
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Q48480;
Q1-NOV-1996;
Q1-NOV-1996;
Q1-MAR-2002
                                                                                     SEQUENCE FROM N.A.
SEQUENCE FROM N.A.
STRAIN=SEROTYPE 08;
MEDLINE=96359375; PubMed=8752339;
MEDLINE=96359595; PubMed=8752339;
MEDLINE=96359595
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EMBL; AF298591; AAL68433.1; --
EMBL; AF246898; AAL68421.1; --
EMBL; AY078347; AAL82783.1; --
InterPro; IFR002495; GT.8.
                    SEQUENCE FROM N.A. STRAIN=SEROTYPE O8; MEDLINE=97158136; P
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P.R.,
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83; Conserv
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  Hobbs
PubMed=9004408;
s M., Valvano M.A.,
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25.0%;
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Pred. No. 4.8e-15;
66; Mismatches 125
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Q8VU29
ID Q8VU2
AC Q8VU2
DT 01-MA
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DT 01-JU
DT 01-JU
DT 01-Strep
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OC Strep
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RN [1]
RP SEQUE
RC STRAI
RA Griff
RT Serot
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DR Inter
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Best Local S
Matches 79
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Best Local Similarity
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Q8VU29; U1-MAR-2002 (TrEMBLrel. 20,
01-MAR-2002 (TrEMBLrel. 20,
01-JUN-2002 (TrEMBLrel. 21,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Coplin D., Kido N., Klena J., Maskell D., Raetz C.R., Rick P "Bacterial polysaccharide synthesis and gene nomenclature."; Trends Microbiol. 4:495-503(1996).

EMBL; L41518; AAC98407.1; -.

INTERPRO; IPRO02495; GT_B.

Pfam; PFO1501; Glyco_transf_8; 1.

SEQUENCE 630 AA; 72599 MW; BABDF92A6D1193AA CRC64;
                                                                                                                                                                                                                                     Pfam;
                                                                                                                                                                                                                                                                                          Griffiths D.B., Hall L.M.C.;
"The Capsular Polysaccharide Serotype 6B.";
                                                                                                                                                                                                                                                                                                                                                                        Streptococcaceae;
NCBI_TaxID=1313;
                                                                                                                                                                                                            SEQUENCE
                                                                                                                                                                                                                                                 Submitted (MAR-2000) to the EMBL; AF246897; AAL68409.1; InterPro; IPR002495; GT_8.
                                                                                                                                                                                                                                                                                                                                                                                                      Streptococcus pneumoniae.
Bacteria; Firmicutes; Bacillus/Clostridium
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DLGGNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVE
                                         NWIE-NVE--IPFKLHLDRGSISSFSRLFLGSVLPSSMSKVLYLDSDIIVMDSLRSILDI 117
                                                                    RFIDVNPEDFAGFPLNIRHISITTYARLKLGEYI-ADCDKVLYLDTDVLVRDGLKPLWDT 117
                                                                                                                        MDIVFAADDNYAAYLCVAAKSVEAAHPDTEIRFHVLDAGISEENRAAV--AANLRGGGNI
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                                                                                               MDIVYATDNNFVDVLSASIKSLYTTNSDLDLNLWIIADKVSDRNKEKINRLSKQFAQREI
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79; Conserv
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Last sequence
Last annotation
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Pred. No. 8.9e
63; Mismatches
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Pred. No. 1.9e
47; Mismatches
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1.9e-14;
ches 108;
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3.9e-14;
nes 117;
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Q97P76;
Q1-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro; IPR002495; GT_8.

Pfam; PF01501; Glyco_transf_8; 1.

Transferase; Complete proteome.

SEQUENCE 406 AA; 47412 MW; D1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Tettelin H., Nelson K.E., Paulsen I.T., Eisen J.A., Read T.D., Peterson S., Heidelberg J., DeBoy R.T., Haft D.H., Dodson R.J., Durkin A.S., Gwinn M., Kolonay J.F., Nelson W.C., Peterson J.D., Umayam L.A., White O., Salzberg S.L., Lewis M.R., Radune D., Holtzapple E., Khouri H., Wolf A.M., Utterback T.R., Hansen C.L., McDonald L.A., Feldblyum T.V., Angiuoli S., Dickinson T., Hickey Holt I.E., Loftus B.J., Yang F., Smith H.O., Venter J.C., Dougherty B.A., Morrison D.A., Hollingshead S.K., Fraser C.M.; "Complete genome sequence of a virulent isolate of Streptococcus pneumoniae."
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Streptococcus pneumoniae.
Bacteria; Firmicutes; Bacillus/Clostridium group; Lactobacillales;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Glycosyl transferase, family 8.
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01-MAR-2002
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EMBL; AE007469; AAK75841.1; -.
                  225
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TIGR; SP1766;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 MEDLINE=21357209; PubMed=11463916;
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                                                 241
                                                                                   171
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                 ILHYISQDKPWNQFSVGRLREVWWEYSLMD---
                                              VSHYCGSAKPWH-----RDCTVWGAERFTELAGSLTTVPEEWRGKLAVPPTKCML 290
                                                                                                                                                                              GNWVGACIDLFVERQEGYKQKIGMADGEYYFNAGVLLINLKKWRRHDIFKMSCEWVEQYK 180
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                                                                                ENVEEGDQSILNMLFKDQYSSLEDQYNFQ-IGYDYGAATFKHQFIFDIPLE----PLPL-
                                                                                                               DVMQYQDQDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMPVA 240
                                                                                                                                                                                                                 KLIGSQFQMNWSNKLPHINHMTFARYFIPDFVTE-DKVLYLDSDLIVTGDLTDLFELDLG
                                                                                                                                                                                                                                              IDVNPEDFAGFPLNIRHISITTYARLKLGEYIADCDKVLYLDTDVLVRDGLKPLWDTDLG 120
                                                                                                                                                                                                                                                                                  VVFAGDYAYIRQIETAMKSL--CRHNSHLKIYLLNQDIPQEWFSQIRIYLQEMGGDLIDC
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                                                                                                                                                                                                                                                                                                                                                     81;
                                                                                                                                                                                                                                                                                                                                                                    Similarity
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(TrEMBLrel. 18, Last sequence
(TrEMBLrel. 20, Last annotation
                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                         14.4%; SCULE ... 2.9e-13; 27.5%; Pred. No. 2.9e-13; Hive 53; Mismatches 127;
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                                                                                                                                                 -GAGVG---FNAGVLLINNKKWGSETIRQKLIDLTEKEH
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                 WSVILNEWFSKSVKYPSKSQI
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RESULT 14
Q97P7
ID Q97P7
AC Q97P7
AC Q97P7
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068207;
01-AUG-1998
01-AUG-1998
01-MAR-2002
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Q97P77;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Interpro; IPR002495; GT_8.

Pfam; PF01501; Glyco_transf_8; 1.

Transferase; Complete proteome.

SEQUENCE 398 AA; 46365 MW; 44
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Bacteria; Firmicutes; Bacillus/Clostridium group; Lactobacillales;
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01-OCT-2001 (TrEMBLrel.
01-MAR-2002 (TrEMBLrel.
  Bacteria;
                             Escherichia
                                                     WAAS.
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EMBL; AE007469; AAK75840.1; -.
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  Proteobacteria;
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(TrEMBLrel. 18, Last sequence update)
(TrEMBLrel. 20, Last annotation update)
andferase, family 8.
                             coli.
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gamma subdivision; Enterobacteriaceae;
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                                                                                                  Last sequence update)
Last annotation update)
                                                                                                                                                       Created)
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2; Mismatches
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Heinrichs D.E., Monteiro M.A., Perry M.B., Whitfield C.;
"The assembly system for the lipopolysaccharide R2 core-type of
Escherichia coli is a hybrid of those found in Escherichia coli K-12
and Salmonella enterica. Structure and function of the R2 Waak and
Waal homologs.";
                                                                                                                                                                                                                                                                                                                                                                                                         Mol. Microbiol. 30:221-232(1998).
EMBL; AF019375; AAC69655.1; -.
InterPro; IPR002495; GT_B.
Pfam; PF01501; Glyco_transf_B; 1.
SEQUENCE 290 AA; 33801 MW; 3AlA6FAF40C7AF7B CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=99009352; PubMed=9791168; Heinrichs D.E., Yethon J.A., Whitfield C.; Heinrichs basis for structural diversity in the core regions of the "Molecular basis for structural diversity in the core regions of the lipopolysaccharides of escherichia coli and salmonella enterica.";
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NCBI_TaxID=562;
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                                                         221 QNKPWYK---IFRAQNF
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                                                                                                                                                                        VAAKSVEAAHPDTEIRFHVLDAGISEENRAAVAANLRGGG---NIRFI----DVNPEDFA 69
                                                                                      SAKPWHRDCTVWGAERF
                                                                                                                   QDVLNILLNGRVHYLDKKYN-------NKTTLSVRCDEEQKNLPNTIIMHYVT 220
                                                                                                                                              QDILNGLFKGGVCYANSRFNFMPTNYAFMANGFASRHTDPLYLDRTNTAMP-VAVSHYCG 246
                                                                                                                                                                                                                                  LGIPL----STCLRFLIPEVIDDKINKILYLDCDVICNGPLDELVDYNLNAD-IACV 115
                                                                                                                                                                                                                                                                                          -GFPLNIRHISITTYARLKLGEYIAD-CDKVLYLDTDVLVRDGLKPLWDTDLGGNWVGAC 127
                                                                                                                                                                                                                                                                                                                                                                  h 13.9%; Score 230.5; DB 2; Length 290; Similarity 28.8%; Pred. No. 1.1e-12;
                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                      263
             2
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             2002, 12:02:17
                                                                                                                                                                                                                                                                                                                                                    46; Mismatches 100;
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Post-processing: Minimum Match 0%
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Perfect score:
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Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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length: 2000000000
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Gapop 10.0 , Gapext 0.5
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1764
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                                                                                                                      SIDS2/gcgdata/geneseq/geneseqp-emb1/Aa198 DAT: *

/SIDS2/gcgdata/geneseq/geneseqp-emb1/Aa198 DAT: *

/SIDS2/gcgdata/geneseq/geneseqp-emb1/Aa198 DAT: *

/SIDS2/gcgdata/geneseq/geneseqp-emb1/Aa199 DAT: *

/SIDS2/gcgdata/geneseq/geneseqp-emb1/Aa200 DAT: *
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Copyright (c) 1993 - 2002 Compugen Ltd
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/SIDS2/gcgdata/geneseq/geneseqp-emb1/AA1981.DAT:*
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SUMMARIES

Res

Enzyme EPS8 which	AAY54072	21		12.2	215	10
C glutamicum prote	AAG90151	22		12.4	219.5	φ
EpsN. Lactococcus	AAB47426	22		12.7	223.5	œ
Putative glycosylt	AAB96313	22	298	13.8	243	7
Neisseria gonorrhe	AAW89332	20		14.7	260	0
Neisseria meningit	AAU72923	23		58.7	1036	5
Neisseria polyglyc	AAW06576	18		59.3	1046	4
N. gonorrhoeae gly	AAR91311	17		59.5	1049	ω
Lipo-oligosacchari	AAW06579	18		99.8	1761	N
N. gonorrhoeae gly	AAR91314	17		100.0	1764	ם
Description	ID	DB	Query Match Length DB	Query	Score	No.

Streptococcus poly	ABP25821	23	310	9.6	169	5
EpsM. Lactococcus	AAB47427	22	329	9.8	173.5	44
Amino acid sequenc	AAY68985	21	209		174	43
-	AAB96485	22	350	9.9	175.5	42
acid s	AAY43773	21	322	•	180.5	41
O .	AAY54071	21	322	•	180.5	40
Sugar transferase	AAW88312	20	260		181	39
Ωı	ABB54192	23	442	10.3	182	38
tococcus	ABP27303	23	313		182.5	37
ps2J protein	AAY68962	21	332		185.5	36
. pneumoniae	ABP54654	23	281	•	185.5	35
	AAW61236	19	281	•	185.5	34
Campylobacter jeju	AAY97203	21	270		185.5	ω
Amino acid sequenc	AAY43800	21	336	•	186.5	32
Enzyme EPSM involv	AAY54098	21	336	•	186.5	31
lobacter	AAY97206	21	301		187	30
protein	AAY68974	21	322	•	187.5	29
pslJ protein	AAY68975	21	322	•	190	28
treptococcus	ABP26805	23	321		194	27
glutamicum [AAG90140	22	345	11.1	195	26
Streptococcus pneu	AAY81720	21	328	•	199	25
S.thermophilus exo	AAW22177	18	324	•	199	24
S.thermophilus exo	AAW14078	18	324	•	199	23
Listeria monocytog	ABB48565	23	327	•	200.5	22
P. multocida hyalu	AAY96212	21	702	•	201.5	21
	AAY68963	21	334	•	204	20
acid s	AAY43795	21	268	•	205.5	19
	AAY54093	21	268	•	205.5	18
irella	AAM47336	23	965	•	207.5	17
s1K proteir	AAY68976	21	278	•	207.5	16
Cı	AAY43099	21	972	•	209	15
	AAY06212	20	972	11.8	209	14
asteurella π	47	23	965	•	209	<u>1</u> 3
ltocida	962	21	965	11.8	209	12
Amino acid sequenc	AAY43774	21	316	12.2	215	11

ALIGNMENTS

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RESULT 1
AAR91314
ID AARS
 Nucleic acids encoding diagnosis of infection oligo:saccharide(s)
                                                                                                                                                                                           Glycosyltransferase; lipo-oligosaccharide; vaccine.
                                   WPI; 1996-200924/20
N-PSDB; AAT14061.
                                                               Gotschlich EC;
                                                                                                                                       04-APR-1996
                                                                                                                                                                         Neisseria gonorrhoeae strain F62.
                                                                                                                                                                                                                    N. gonorrhoeae glycosyltransferase LgtD
                                                                                                                                                                                                                                        09-JUL-1996
                                                                                                                                                                                                                                                           AAR91314;
                                                                                                                                                                                                                                                                            AAR91314 standard; Protein; 337 AA.
                                                                                                  26-SEP-1994;
                                                                                                                   25-SEP-1995;
                                                                                                                                                       WO9610086-A1.
                                                                                (UYRQ ) UNIV ROCKEFELLER.
                                                                                                                                                                                                                                        (first entry)
                                                                                                 94US-0312387
                                                                                                                   95WO-US12317.
        glycosyl transferase(s) with Neisseria and for the
                                                                                                                                                                                                    lgt gene; LOS locus;
        used in the biosynthesis
         of
f
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RRESULT 2
AAW0657
ID AAW0
XX AAW0
XX AAW0
XX Lipo
XX Lipo
XX Poly
KW Poly
KW Poly
KW W-ac
XX W-ac
XX W-ac
XX W096
XX W
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Best Local S
Matches 337
                                                                                                                                 07-JUN-1995;
                                                                                                                                                                                  03-JUN-1996;
                                                                                                                                                                                                                                                                                         WO9640971-A1
                                                                                                                                                                                                                                                                                                                                                                                       Polyglycosyltransferase; N-acetylgly N-acetylgalactosaminyl transferase;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lipo-oligosaccharide gene-encoded protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAW06579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         contg. activated GalNAC or GicNAC to an acceptor moiety comprising a Gal residue in the presence of LgtD. Oligosaccharides can be produced that, when attached to non-toxic lipids, are useful for Neisseria vaccine prepn. Blood group core oligosaccharides, and minics of lacto-N-neotetraose, gangliosides and saccharide portions of globoglycolipids can also be produced using the enzymes.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 5 Glycosyltransferases (AAR91311-15) are products of the lgt locus (AAT14061) of Nelserria gonorrhoeae strain F62. Glycosyltransferase LgtD (AAR91314) can be obtd. by expression of the lgtD coding sequence in recombinant host cells. A method for adding GalNAc or GlcNAc betal-3 to Gal comprises contacting a reaction mixture
                                                                              (NEOS-) NEOSE
                                                                                                                                                                                                                                     19-DEC-1996
                                                                                                                                                                                                                                                                                                                                       Neisseria gonorrhoeae ATCC 33084
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            21-MAR-1997
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TDLLDFLTDRVMRKLFAAPQYRKILKKMLRPWKYRSY 337
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GLRFDPAYTHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          al Similarity
337; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Fig
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   337 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (first entry)
                           Johnson KF,
                                                                              TECHNOLOGIES INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2e;
                                                                                                                                 95US-0478140
                                                                                                                                                                                  96WO-US08323.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Protein;
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                                                                                                                                                                                                                                                                                                                                                                                                                     N-acetylglucosaminyl transferase;
                           Roth
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 1764; DB 17;
Pred. No. 3.6e-178;
; Mismatches 0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ₽
                                                                                                                                                                                                                                                                                                                                                                                          lipo-oligosaccharide
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RESULT 3
AAR91311
ID AAR9
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Query Match
Best Local Similarity
                                                                                                                                                             Glycosyltransferase;
                                                                                                                                                                                                                                                          AAR91311 standard;
                                                                                                    WO9610086-A1.
                                                                                                                         Neisseria gonorrhoeae strain
                                                                                                                                                                                                            09-JUL-1996
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          stated in the specification.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     gonorrhoeae ATCC 33084 includes coding sequences for 5 proteins (AAW06576-80), one of which (ABW06576) is a polyglycosyltransferase that catalyses the addition of GloNAc and GalNAc disaccharides to a galactose moiety. The function of the other 4 proteins is not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Disclosure; Fig 2E-F; 38pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Transfer of at least 2 saccharide units using poly:glycosyl:transferase - isolated from N. gonorrhoeae, catalyses the addition of both GlcNac and GalNac di:saccharide(s) units to a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 1997-052351/05.
N-PSDB; AAT49230.
        (UYRQ ) UNIV
                               26-SEP-1994;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A lipooligosaccharide-encoding
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                                                                                                                                                                                   gonorrhoeae glycosyltransferase LgtA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               μ
                                                                                                                                                                                                                                                                                                                  GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                                             GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     TDLLDFLTDRVMRKLFAAPQYRKILKKMLRPWKYRSY
                                                                                                                                                                                                                                                                                                                                                                EIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSL
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         ROCKEFELLER
                                                                                                                                                                                                            (first entry)
                               94US-0312387
                                                       95WO-US12317
                                                                                                                                                                                                                                                          Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99.8%;
99.7%;
                                                                                                                                                             lipo-oligosaccharide;
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Pred. No. 7.5e-178;
1; Mismatches 0;
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                                                                                                                                                             locus;
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                                                              Neisseria
                                                                                      N-acetylgalactosaminyl transferase; lipo-oligosaccharide
                                                                                                   Polyglycosyltransferase; N-acetylglucosaminyl transferase;
                                                                                                                             Neisseria polyglycosyltransferase.
                                                                                                                                                        21-MAR-1997
                                                                                                                                                                                AAW06576;
                                                                                                                                                                                                          AAW06576 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5 Glycosyltransferases (AAR91311-15) are products of the 1gt locus (AAR14061) of Neiserria gonorrhoeae strain F62. Glycosyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Claim 8; Fig
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Nucleic acids encoding diagnosis of infection
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                                      WO9640971-A1
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DB; AAT14061.
                                                                                                                                                                                                                                                                                                                                          KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY 298
                                                                                                                                                                                                                                                                                                                                                                                           DGGLREDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKI 238
                                                                                                                                                                                                                                                                                                                                                                                                                               PSGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
                                                                                                                                                                                                                                                                                                SLTDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                                                                                                                                                                                                                                                                                                                           QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP 300
                                                                                                                                                                                                                                                                                                                                                                             DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI
                                                                                                                                                                                                                                                                                                                                                                                                                                                 IAMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI 178
                                                             gonorrhoeae
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                                                                                                                                                      (first entry)
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                                                                                                                                                                                                          Protein;
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                                                               ATCC
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            English.
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                                                               33084
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Pred. No. 2.5e-102;
13; Mismatches 83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 348;
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Best Local S
Matches 213
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          gonorrhoèae ATCC 33084 catalyses the stereospecific conjugation of 2 specific activated saccharide units (e.g. UDP-GLNAC, UDP-GALNAC, UDP-GALNAC, UDP-GALNAC, UDP-GALNAC, UDP-GALNAC, UDP-GALNAC, It is the first PGTase reported to be capable of transfer of more than one different saccharide moiety. The PGTase is encoded by nucleotides 445-148 of a lipo-oligosaccharide gene (AAT49330). It can be produced in transformed host cells and used
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Transfer of at least 2 saccharide units using poly:glycosyl:transferase - isolated from N. gonorrhoeae, catalyses the addition of both GlcNac and GalNac di:saccharide(s) units to a
                                                                                                                                                   AAU72923 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Disclosure; Fig 2A-C; 38pp; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   03-JUN-1996;
                          intection;
                                       Meningitis; virulence;
                                                                                              12-MAR-2002
                                                                                                                        AAU72923;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WPI; 1997-052351/05
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                                                                                                                                                                                                                       PSGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
                                                                                                                                                                                                                                                 SLTDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                                                                                                                                                                                                                                                                                                                                   DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI
                                                                                                                                                                                                                                                                                                                                                   DGGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKI 238
                                                                                                                                                                                                                                                                                                                                                                                         IAMGAWLEVLSEEKDGNRLARHHKHGKIWKKPTRHEDIAAFFPFGNPIHNNTMIMRRSVI
                                                                                                                                                                                                                                                                                                                                                                                                        IAMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI
                                                                                                                                                                                                                                                                               QKTARNDFLQSMGFKTRFDSLEYRQTKAAAYELPEKDLPEEDFERARRFLYQCFKRTDTP
                                                                                                                                                                                                                                                                                                    KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY
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213; Conser
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                                                                   meningitidis virulence
                       ; virulence; gene; antibacterial; vaccine;
Gram-negative bacteria; antimicrobial.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       348 AA;
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                                                                                           (first entry)
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Pred. No. 5.3e-102;
4; Mismatches 83;
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                                                                 protein
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Neisseria meningitidis

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AC AAW8
XX
AC AAW8
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DT 26-F
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Best Local Similarity 63.0
Matches 208; Conservative
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                                  26-FEB-1999
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                                                                AAW89332;
                                                                                              AAW89332 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
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                                                                                                                                                                                                                                                                                                                                                                                   MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                              RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
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DB; AAS97208.
                                                                                                                                                                          GAWLDFAADGKMRRLFTMRQYFGILHRLIK 330
                                                                                                                                                                                                       TDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                                                                                                                                                                                                                                        TARNDFLQSMGFKTRFDSLEYRQIKAVAYELLEKHLPEEDFERARRFLYQCFKRTDTPPA
                                                                                                                                                                                                                                                                     EIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSL 300
                                                                                                                                                                                                                                                                                                                                                                 MGAWLEVLSEEKDGNRLARHHRHGKIWKKPTRHEDIADFFPFGNPIHNNTMIMRRSVIDG
                                                                                                                                                                                                                                                                                                                                                                                                                             KILAQAQNSGLIPSLNIGLDELAKSGMGEYIARTDADDIAAPDWIEKIVGEMEKDRSIIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LQPLVSVLICAYNVEKYFAQSLATVVNQTWRNLEILIVDDGSTDGTLAIAKDFQKRDSRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MICROSCIENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                346
                                  (first entry)
                                                                                            peptide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 58.7%;
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Pred. No. 6e-101;
6; Mismatches 86;
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Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A method has been developed of expressing a glycosyltransferase in a host cell. The method comprises introducing into the host cell a nucleic acid encoding the glycosyltransferase and incubating the host cell under conditions appropriate for expression of the glycosyltransferase, where the host cell substantially lacks a protease that cleaves polypeptides between two consecutive positively charged amino acid residues. The glycosyltransferase can be used in in vitro production of oligosaccharide structures which are potential therapeutic agents for use in the manipulation of cell-cell recognition events, particularly adhesion of bacteria and viruses to mammalian cells and leukocyte-endothalial cell interaction through selectins in inflammation. The method provides more readily recoverable active glycosyltransferases than prior art methods involving mammalian glycosyltransferases. The present sequence represents a C-terminal peptide from Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Expressing high levels of glycosyltransferases - comprises use of either host cells deficient in proteolytic enzymes or modified glycosyltransferase genes deleted in a proteolytic recognition site
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria meningitidis; lgtC; lgtB; beta glycosyltransferase; proteolytic enzyme.
                                                                                                                                                                                                                                          AAB96313 standard; Protein; 298
                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
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                                                                                      Pyrococcus abyssi.
                                                                                                                   Hyperthermophilic archaeon; hyperthermophilic protein
                                                                                                                                                Putative glycosyltransferase, involved in cell wall biogenesis
                                                                                                                                                                                29-OCT-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    gonorrheae
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                                                                                                                                                                                                                                                                                                                                               285 RLFLYEYFLSLEKYSLTDLLDFLTDRVMRKLFAAPQYRKILKKMLRPWKY 334
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                                                                                                                                                                                                                                                                                                                                                                                           14.7%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   the present invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          English.
                                                                                                                                                                                                                                                                                                                                                                            Score 260; DB Pred. No. 6.20; Mismatches
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21-APR-1999; 27-OCT-2000. FR2792651-A1

99FR-0005034

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RESULT 8
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Best Local S
Matches 83
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Note: This patent is in the same patent family as WO200065062, which contains additional sequences as shown in AAB99132-AAB99143, AAH75903-AAH75920 and AAG66436.
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                               biosynthesis;
                                        EPS plasmid; Lactococcus lactis subspecies cremoris Ropy352; exopolysaccharide; EPS352; milk; thickener; glycosyltransferase;
                                                                                                                                             AAB47426;
                                                                                                                                                                      AAB47426 standard;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   New nucleotide sequences isolated from Pyrococcus proteins useful in industry -
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Querellou J,
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Lactococcus lactis
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                                                                                                                                                                                                                                                                                                                                                                                       VIDGGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTS---SKYNLQQRR 233
                                                                                                                                                                                                                                                                                                                                                                                                                    VYGGFYY------VSQDGRILGKRLPKHRGDIYSHLLKENFIGSPTLLIRRE 162
                                                                                                                                                                                                                                                                                                                                                                                                                                           IAMGAWLEVLSEENNKSVLAAIARNGAIWDK--PTRHEDIVAVFPFGNPIHNNTMIMRRS 176
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          YIRLKKNSGGPIARNIGI----KKAKGRFIALLDDDDEWLPHRLEVQVRKFENLGKEFGV 116
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   RPIVSVIIPTYNRANLLRRAIASVLNQKFKDFELIVVDDASTDNTPEVVESI--EDGRIR 60
                                                                                                                                                                                                                                              ----LNLENYMI
                                                                                                                                                                                                                                                                        LFLYEYFLSLEKYSL 300
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                                                                                                                                                                                                                                                                                                     LIRK-----HLDIWKNPKI-LSIHLSQMGLLLLLSNNTGKGLKYLTYSIAIAP------
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Weissenbach
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                                                                                                                                                                        Protein;
                             juice.
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26.3%; Pred. No. 6.1e-17;
tive 48; Mismatches 128;
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RESULT 9
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ID AAG9
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AAG90151 standard;

Protein;

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The sequences given in AAB47426-27 are encoded by a fragment of the EPS cplasmid derived from L. lactis subspecies cremoris Ropy352. The EPS plasmid is about 32 kb in size and encodes at least 13 active genes. The enzymes encoded by these genes allow the bacteria to produce an exopolysaccharide, designated EPS352. When EPS352 is expressed in or cadded to milk, it imparts highly desirable sensory characteristics to the milk, including making the milk very thick, with a very smooth counth-feel, and slightly sweet with an obvious chewable-bite. Open reading frames (ORF's) M and N show homology to glycosyltransferase involved in EPS352 biosynthesis. L. lactis cremoris Ropy352 is deposited with the USDA-ARS-NCAUR-NRRL as deposit accession number NRRL B-30229. EPS352 is useful for thickening a liquid selected from Cmilk, a milk-based liquid, a whey-based liquid, a soy-based liquid, and a fruit-juice. It is also useful as an additive in pharmaceutical products, beauty care products and coating agents.
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Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        New bacterium useful in pharmaceutical formulations, food products beauty cosmetics, comprises characteristics of Lactococcus lactis
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217
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                                                             TSSKYN 228
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   ASKKFS
                                                                                                                                                                                                                                                                YYICKGKNIYPNVNNDLLECEGLLSRDKTMRSILSDTGFKGFVW--------
                                                                                                                              ----TRIFRKNVIN-NVKFNESINYLEDMLFNISIVHNARIIAYTNKRHYFYLQREDS
                                                                                                                                                                                               NPIHNNTMIMRRSVIDGGLRFDPAYIHAEDYKFWYEAGKLGR-LAYYPEALVKYRFHQDQ 222
                                                                                                                                                                                                                                                                                                                                                                                            -NTKNLGVSHARNYGIDR----ASGSYIMFLDPDDTYDKSYCLEMIGLINKFNADVVMSN 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LISITVPVYNSEKYLRAAIHSLLNQTYQNIEVILINDGSTDGSQELISSFQKKDKRIKLY 64
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US DEPT OF AGRICULTURE.
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222
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2000US-0241098.
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Pred. No. 8.4e-15;
5; Mismatches 81
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Best Local
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Note: The sequence data for this patent did not form part of the printed specification, but was obtained in electronic format directly from the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Novel polynucleotides derived from Coryneform bacteria, for identifying mutation point of a gene, measuring expression of a gene, analysing expression profile or pattern of a gene and identifying homologous gene
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           sequences from the Coryneform bacterium Corynebacterium glutamicum. These are useful for identifying the mutation point of a gene derived from a mutant of coryneform bacterium, measuring expression amount and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         16-DEC-1999; 99JP-0377484.
07-APR-2000; 2000JP-0159162.
03-AUG-2000; 2000JP-0280988.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Corynebacterium glutamicum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Nakagawa S,
Tateishi N,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Coryneform bacterium; amino acid synthesis; vitamin; saccharide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     European Patent Office.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB; AAH65370
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    18-DEC-2000; 2000EP-0127688
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         The present invention provides a number of nucleotide and protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              (KYOW ) KYOWA HAKKO KOGYO KK
222 WIILKRRMELASFLKRSPVRQIFLNFIWYGAQVTRYLGLRKAGFMTGY
                                                                235
                                                                                                                                 164
                                                                                                                                                                                           177
                                                                                                                                                                                                                                                                                                                   121
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6
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                                                             AWKIKEEIR-AGYWKAAGIA------VGADCLNY-GLLKS---TAY
                                                                                                                                                                                                                                                                                                                                                                                                                                       RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPA--IARHFQEQDGRI 60
                                                                                                                       VVEQIGGYSLE--MTRSQDYELFLRLSKIGAIGYLDESLSSYRIHGGQHSRKTSPFKKYT
                                                                                                                                                                                  VID--GGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRT
                                                                                                                                                                                                                                                                                                            MGAWLEVLSEENNKSVLAAIARNGAIW----DKPTRHEDIVAVFPFGNPIHNNTMIMRRS 176
                                                                                                                                                                                                                                                                                                                                                                             KIVEQKIRQGTPTSLNNGI----KASDGQLIARLDSDDLAAPSRLSKQEEFLRNHPYIIC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PLISVVIPTIAYDEYCSQSIKSVCEQNYENWQIVLV----LDGAPIKDVPQWVKEHE-RI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2001-376931/40.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   acid synthesis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQ ID NO: 3905; 246pp + Sequence Listing; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           274 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mizoguchi H,
Senoh A, Ik
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              protein fragment SEQ ID NO: 3905
                                                                                                                                                                                                                                                     -----HGKIFGQSADLPT-SQDIRQILLVKNPIIHSSVMYRKQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          12.4%; Score 219.5; DB 27.1%; Pred. No. 1.7e-14
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ikeda M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Ando S, m., ozaki A;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         57; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Hayashi M,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   108;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Length 274;
   269
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             45; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Yokoi
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MNPLISIIVPTYNVEKYIRTCIESILAQTYRNIEVIIVNDGSTDQSLAVISDLICSHHNI 60

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RESULT 10
AAY54072
ID AAY54
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                                                                                                          AAY54065-74 represent enzymes involved in the biosynthesis of exopolysaccharides (EPS). These enzymes are designated EPS1-EPS10. and are encoded by open reading frames eps1-eps10. The enzymes are isolated from Streptococcus thermophilus strain Sfi39. The proteins are used in a method for the synthesis of EPS, which includes at least one step of forming a bond (alpha or beta-isomer) between C-1 (carrying the reducing aldehyde function, of an activated D-galactose pyranose), and a phosphate on a lipophilic or proteinaceous primer. Stepwise synthesis of EPS occurs with, in each step, addition of a new sugar unit, through its hemi-acetyl function, to an alcoholic hydroxyl of a second sugar unit, present at the end of a chain of sugar residues bonded to the primer. EPS1 to EPS4 are used to elongate the EPS Chain, and to regulate EPS production, EPS5 creates new bonds between saccharides, EPS6 is a transporter of repetitive units, and EPS8 are beta-glycosyltransferases, EPS9 is a transporter of repetitive units, and EPS10 (catalyses the conversion of a pyranose form of a beta-D-galactose to the furanose form. The EPS enzyme are used to improve properties of foods, particularly fermented milk products such as yoghurt and cheese,
                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22-APR-1998;
22-APR-1998;
22-APR-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 3; Page 105-106; 162pp; French.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY54072 standard;
                                                                                                          Sequence
                                                                                                                                        e.g. their organoleptic properties and flavour stability.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    New recombinant enzymes for synthesis of exopolysaccharides, particularly in lactic acid bacteria, for improving properties
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-PSDB; AAZ45258, AAY54072, AAY54073, AAY54074.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Stingele F,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             09-DEC-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            activated D-galactose pyranose; saccharide; beta-glycosyltransferase;
transporter; food; fermented milk product; yoghurt; cheese;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Exopolysaccharide;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Enzyme EPS8 which
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    27-MAR-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY54072;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2000-097267/08
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              flavour stability;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     fermented milk products
1 MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Lysaccharide; EPS;
EPS7; EPS8; EPS9;
                                                          Similarity
                                                                                                           316 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          PROD NESTLE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Germond JE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              thermophilus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98EP-0201310.
98EP-0201311.
98EP-0201312.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           99WO-EP02841
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entry)
                                                      12.2%; 23.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 involved in exopolysaccharide biosynthesis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EPS10; Streptococcus the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Lamothe
                                        59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       316
                                      Score 215; DB 21;
Pred. No. 6.2e-14;
9; Mismatches 105
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 thermophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EPS3;
                                        Indels 106;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EPS4;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               strain Sfi39;
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                                     Gaps
                                        14;
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RESULT 11
AAY43774
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AAY43767-76 represent the proteins encoded by the eps operon of Streptococcus thermophilus Sfi39. The operon contains 10 open reading frames, and encodes enzymes (eps1, eps2, eps3, eps4, eps5, eps6, eps7, eps8, eps9 and eps10) that are involved in the biosynthesis of exopolysaccharides (EPS). The enzymes catalyse the formation of specific intersugar bonds. The enzymes catalyse a process that includes at least one step of forming a bond (in alpha or beta anomeric form) between C1, carrying the reducing aldehyde group of an activated D-Galp (galactose in pyranose form), and a phosphate group on a lipophilic or proteinaceous primer. The enzymes are used to produce EPS that have antitumor or probiotic properties or are used in foodstuffs to improve
                                                                                                                                                                                     Claim 3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   eps3; eps4; eps5; eps6; eps7; eps8; eps9; eps10;
exopolysaccharide biosynthesis; EPS; intersugar bond; antitumour;
probiotic; foodstuff; organoleptic quality; flavour;
lactic acid bacteria; acidified milk product; yoghurt; cheese.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAY43774 standard;
                                                                                                                                                                                                                                                 New recombinant
                                                                                                                                                                                                                                                                                                                         Stingele F,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Streptococcus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Amino acid sequence of eps8 of Streptococcus thermophilus Sfi39.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           11-FEB-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                22-APR-1999;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          W09954475-A2
                                                                                                                                                                                                                                                                                                                                                                                     22-APR-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                  22-APR-1998;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              operon;
                                                                                                                                                                                                                                 antitumor
                                                                                                                                                                                                                                                                                          2000-013255/01
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           GCLRLFLYEYFLSLEKYSLTDLLDFLTDRVMRKLFAAPQYRKILKKMLRPW 332
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TTKTTKNAQK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VWSSIYRLDFINSNHIRFTPGILF-EDADFTIRAYMLAKLVATSPEPNYAYRINRPGSIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---TMIMRRSVIDGG-LRFDPAYIHAEDYKFWYEAGKLGRL-AYYPEALVKYRFHQD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MGAWLEVLSEENNKSVLAAIARNGAI ------WDKPTRHEDIVAVFPFGNPIHNN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          KVI-NQKNQGLSVARNTGID----AATGKYIAFVDADDKIKPDFVSSLYQIADKTGADIV 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     QTSSKYNLQQRRTAWKIKEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RGSFRDF-----LDQFLSSNISFV
                                                                                                                                                                                                                                                                                                                                                       SOC
                                                                                                                                                                                                                                                                               AAZ30355,
                                                                                                                                                                                     Page
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ----FISMLKHEKSDVLCSL---ILKSIYAC---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Streptococcus thermophilus Sfi39;
                                                                                                                                                                                                                                                                                                                                                       PROD
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (first
                                                                                                                                                                                                                                                                                                                         Germond JE,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      thermophilus.
                                                                                                                                                                                     106-107;
                                                                                                                                                                                                                                                                                                                                                                                 98EP-0201310.
98EP-0201311.
98EP-0201312.
                                                                                                                                                                                                                              t enzymes for biosynthesis of exopolysaccharides having or probiotic properties or useful in fermented milk
                                                                                                                                                                                                                                                                                                                                                                                                                                                99WO-EP03011.
                                                                                                                                                                                                                                                                                                                                                       NESTLE
                                                                                                                                                                                                                                                                          AAY43774, AAY43775, AAY43776;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        entry)
                                                                                                                                                                                    163pp; French
                                                                                                                                                                                                                                                                                                                                                       SA
                                                                                                                                                                                                                                                                                                                         Lamothe
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    316
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                                                                                                                                                                                                                                                                                                                         <u>ن</u>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 product; yoghurt; cheese
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             enzyme;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ---MSLSEEKIISQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               --MRDW 264
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             eps1; eps2;
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RESULT 12
AAY96213
ID AAY96
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Best Local S
Matches 81
                                                                                                                                                                                                         WPI; 200
N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
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                                              Claim 15; Page 85; 86pp; English
                                                                                       Novel method for the enzymatic transfer of sugar molecules acceptor, useful for synthesis of e.g. polysaccharide bloaddrug delivery systems, including hybrid molecules
                                                                                                                                                                                                                                                                                                                                                                                          11-NOV-1998;
01-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Chondroitan synthase; CS;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              P. multocida chondroitan synthase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAY96213;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAY96213 standard;
                                                                                                                                                                                                                                                                                  DeAngelis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      10-NOV-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          18-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO200027437-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pasteurella multocida.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        121 MGAWLEVLSEENNKSVLAAIARNGAI------WDKPTRHEDIVAVFPFGNPIHNN----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  61
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                                                                                                                                                                                                   2000-376319/32.
DB; AAA27449.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VWSSIYRLDFINSNHIRFTPGILF-EDADFTIRAYMLAKLVATSPEPNYAYRINRPGSIL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MNPLISIIVPTYNVEKYIRTCIESILAQTYRNIEVIIVNDGSTDQSLAVISDLICSHHNI
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 QTSSKYNLQQRRTAWKIKEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   --TMIMRRSVIDGG-LRFDPAYIHAEDYKFWYEAGKLGRL-AYYPEALVKYRFHQD----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            RGSFRDF---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 KVI-NQKNQGLSVARNTGID----AATGKYIAFVDADDKIKPDFVSSLYQIADKTGADIV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  abrasion;
                                                                                                                                                                                                                                                                                  PL;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     316 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (first entry)
                                                                                                                                                                                                                                                                                                                                      OKLAHOMA STATE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -FISMLKHEKSDVLCSL---ILKSIYAC--
                                                                                                                                                                                                                                                                                                                                                                                          98US-0107929
99US-0283402
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      99WO-US26501
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  viscoelastic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -----NGNIPKGWVPDFNVPTNYGTIV----LDQFLSSNISFV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                12.2%;
23.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        enzyme;
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Pred. No. 6.2e-14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  rme; hyaluronic acid; ulce
replacement; bioadhesive.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -MSLSEEKIISQ--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              a smooth, creamy
                                                                                                                          cules to an bioadhesives
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             106;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 115
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The present sequence is

the Pasteurella multocida chondroitan synthase

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RESULT 13
AAM47335
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Query Match
Best Local
useful as hyaluronan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PmCS. PmCS catalyses glycosaminoglycan polymerisation to produce chondroitan: a linear polysaccharide which has viscoelastic properties which makes it useful for a number of applications. Chondroitan can be used with hyaluronic acid (HA) to coat medical devices e.g. catheters and sensors to reduce tissue abrasion. In addition, they can be used as bloadhesives for haemostatic sealing and healing of wounds and surgical incisions; and as biomaterials that provide sustained delivery of encapsulated drugs, to wounds, ulcers, injuries or surgical sites.
           New chondroitin synthase gene obtained from Pasteurella multocida, useful as hyaluronan polysaccharide substitute in medial or cosmet
                                                           WPI; 2002-049237/06.
N-PSDB; ABA05097.
                                                                                                                                                                                                                                                                                                 Pasteurella multocida.
                                                                                                                                                                                                                                                                                                                                             Chondroitin synthase; dermatan sulphate; chondroitin sulphate polymer; eye application; joint application; moisturiser; drug delivery;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAM47335 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                                                                                                                                                                                                                                     01-NOV-2001.
                                                                                                                                                                                                                                                                   WO200180810-A2
                                                                                                                                                                                                                                                                                                                                                                                              Pasteurella multocida chondroitin synthase #1.
                                                                                                                                                                                                                                                                                                                                                                                                                             22-FEB-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAM47335;
                                                                                                         De Angelis PL;
                                                                                                                                        (DANG/) DE ANGELIS P
                                                                                                                                                                       25-APR-2000; 2000US-199538P
                                                                                                                                                                                                     25-APR-2001; 2001WO-US13395
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         678
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLE---K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PLVSIYIPAYNCANYIQRCVDSALNQTVVDLEVCICNDGSTDNTLEVINKLYGNNPRVRI 492
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     YSLIDLLDFLIDRVMRK 314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---FNENIENAVDYDMFLKLSEVGKFKHLNKICYNRVLHGDNTSIK-------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ----VYTTNRNVNPDGSLIANGYNWPEFSREKLTTAMI----AHHFRMFTIRAWHLTDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          AWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRS--VIDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MSKPN--GGIASASNAAVSFAK---GYYIGQLDSDDYLEPDAVELCLKEFLKDKTLAC--
                                                                                                                                                                                                                                                                                                                                dressing; biocompatible film.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   965 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                             (first entry)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     11.8%;
23.7%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          965
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 209; DB 21;
Pred. No. 1.5e-12;
3; Mismatches 129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A
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             cosmetic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               240
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RESULT 14
AAY06212
ID AAY06
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Qy
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                                                                                                                                                                                                                                                                                                                                                                                밁
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Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         applications, for example in eye or joint applications, for moisturise: or wound dressings. The enzyme may be used in covalently coupling specific drugs, proteins or toxins to the structurally modified chondroitin for general or targeted drug delivery or radiological procedures, covalently cross linking the hyaluronic acid itself or to other supports to achieve a gel or other three dimensional biomaterial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               with stronger physical properties, and covalently linking hyaluronic to a surface to create a biocompatible film or monolayer. The present sequence is one version of the protein of the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The present invention relates to the coding sequence of the Past multocida chondroitin synthase. A chondroitin polysaccharide may as a hyaluronan polysaccharide substitute in medial or cosmetic
                              26-OCT-1998;
31-OCT-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Claim
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   applications, e.g. wound dressings -
                                                                                                                                                                                      Hyaluronate synthase;
                                                                                                                                                                                                                  Pasteurella multocida hyaluronate synthase pmHAS
                                                                                                                                                                                                                                                16-AUG-1999
                                                                                                                                                                                                                                                                             AAY06212;
                                                                                                                                                                                                                                                                                                         AAY06212 standard;
(OKLA ) UNIV
                                                                      30-OCT-1998;
                                                                                                 14-MAY-1999
                                                                                                                               WO9923227-A2
                                                                                                                                                          Pasteurella multocida
                                                                                                                                                                                                                                                                                                                                                                                678
                                                                                                                                                                                                                                                                                                                                                                                                                                         640
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                                                                                                                                                                                                                                                                                                                                                                                                             298
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    241
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ω
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRS--VIDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PLYSIYIPAYNCANYIQRCVDSALNQTVVDLEVCICNDGSTDNTLEVINKLYGNNPRVRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ---FNENIENAVDYDMFLKLSEVGKFKHLNKICYNRVLHGDNTSIK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GLREDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MSKPN--GGIASASNAAVSFAK---GYYIGQLDSDDYLEPDAVELCLKEFLKDKTLAC--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 122
                                                                                                                                                                                                                                                                                                                                                                                YIFNKTAEYQEEMDMLK
                                                                                                                                                                                                                                                                                                                                                                                                             YSLTDLLDFLTDRVMRK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLE---K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ----VYTTNRNVNPDGSLIANGYNWPEFSREKLTTAMI-----AHHFRMFTIRAWHLTDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Page 119;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       965 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
OKLAHOMA STATE
                                                                                                                                                                                                                                                (first entry)
                            98US-0178851
97US-0064435
                                                                        98WO-US23153
                                                                                                                                                                                                                                                                                                         Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  for eye or joint applications, for moisturizer
                                                                                                                                                                                                                                                                                                                                                                                                                                         ----KLGIQKKNHFVVVNQSLNRQGI---NYYNYDKFDDLDESRK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             11.8%;
23.7%;
                                                                                                                                                                                       pmHAS;
                                                                                                                                                                                                                                                                                                                                                                                694
                                                                                                                                                                                                                                                                                                                                                                                                             314
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                53;
                                                                                                                                                                                                                                                                                                         972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 209; DB 23;
Pred. No. 1.5e-12;
                                                                                                                                                                                       hyaluronic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Mismatches
                                                                                                                                                                                                                                                                                                         A
                                                                                                                                                                                       acid; hyaluronan.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                129;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            965;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   tor moisturiser
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                60;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             may be used
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      492
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AAY43099
ID AAY4
XX
AC AAY4
XX
DT 01-F
XX
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                                                                                   RESULT 15
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               dependence, and different Km values compared with the HAS enzymes of Streptococcus equisimilis (see AAY06206) and Streptococcus pyogenes. Km values are about 2 to 3-fold lower for UDP sugars, and Vmax values are about 2 to 3-fold higher. The invention provides recombinant vectors containing hyaluronate synthase DNA, especially S. equisimilis hyaluronate synthase DNA (see AAX58841), and prokaryotic or eukaryotic host cells which produce the enzyme
             01-FEB-2000
                                     AAY43099;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     different kinetic optima with respect to pH and metal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Disclosure; Page 123-125; 125pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nucleic acid encoding hyaluronate synthase for production of hyaluronic acid with controlled molecular weight and targeting
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            N-PSDB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       WPI; 1999-337486/28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DeAngelis
                                                            AAY43099 standard;
                                                                                                                     838
                                                                                                                                                                                                                                            237
                                                                                                                                                                                                                                                                   661
                                                                                                                                                                                                                                                                                                                  604
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                                                                                                                                                                                                                                                                                                                                                                 553
                                                                                                                                                                                                                                                                                                                                                                                                              500
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                                                                                                                                             307
                                                                                                                                                                     781
                                                                                                                                                                                                                    721
                                                                                                                                                                                                                                                                                          227
                                                                                                                                                                                                                                                                                                                                                                                       123
                                                                                                                                                                                                                                                                                                                                                                                                                                    63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 is present sequence represents the hyaluronate synthase Pasteurella multocida Carter Type A. The pmHAS enzyme
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                3 PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         its hyaluronic acid product, particularly a product with fied structure or molecular size. The hyaluronic acid produced
                                                                                                                                                                                                                                                                                                                ---FNEKIENAVDYDMFLKLSEVGKFKHLNKICYNRVLHGDNTSIKKLGIQKKNHFVVVN
                                                                                                                                                                                                                                                                                                                                     GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSK---------
                                                                                                                                                                                                                                                                                                                                                                                                            MSKPN--GGIASASNAAVSFAK---GYYIGQLDSDDYLEPDAVELCLKEFLKDKTLAC--
                                                                                                                                                                                                                                                                                                                                                                                                                                   ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 122
                                                                                                                     LTHDWIEKINAHPPFKKLIK
                                                                                                                                                                    TSNRLIKTEAHLSNINKLSQLNLNCEYIIFDNHDSLFVKNDSYAY---MKKYDVGMNFSA
                                                                                                                                                                                                                                                                QSLNRQGITYYNYDEFDDLDESRKYIFNKTAEYQEEIDILKDIKIIQNKDAKIAVSIFYP
                                                                                                                                                                                                                                                                                          -----YNLQQ------RRTAW-----
                                                                                                                                                                                                                                                                                                                                                              ----VYTTNRNVNPDGSLIANGYNWPEFSREKLTTAMI----AHHFRMFTIRAWHLTDG
                                                                                                                                                                                                                                                                                                                                                                                     AWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRS--VIDG 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PLVSIYIPAYNCANYIQRCVDSALNQTVVDLEVCICNDGSTDNTLEVINKLYGNNPRVRI 499
                                                                                                                                          LTDRVMRKLFAAPQYRKILK 326
                                                                                                                                                                                          ---GLLKSTAYALYEKALSGQDIGCL-----RLFL----YEYFLSLEKYSLTDLLDF
                                                                                                                                                                                                                  NTLNGLVKKLNNIIEYNKNIFVIVLHVDKNHLTPDIKKEILAFYHKHQVNILLNNDISYY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               is purer than that produced by conventional methods
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       972 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
            (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Kumari
                                                            Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11.8%;
21.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ζ,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Weigel PH;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         60;
                                                             972
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 209; DB 20;
Pred. No. 1.5e-12;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Mismatches
                                                            AA
                                                                                                                                                                                                                                          ---KIKEEIRAGYWK-AAGIAVGADCLNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         146;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 972;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Indels 138;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                          261
                                                                                                                                                                                                                                                                 720
                                                                                                                                                                                                                                                                                         236
                                                                                                                                                                                                                                                                                                                 660
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                                                                                                                                                                                                                                                                                                                                                                                                            552
                                                                                                                                                                                                                                                                                                                                        226
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β
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                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      and for diagnostic applications
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 New isolated hyaluronate synthase nucleic acids, used for production of hyaluronic acid, for developing antibiotics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 70; Fig 20; 121pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Deangelis P;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     14-OCT-1999.
                                                                                                                                                                                                                                                                                                                                        be used as
                       661
                                                                      604
                                                                                             181
                                                                                                                    553
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                                                                                                                                                                  500
                                                                                                                                                                                                                  440
                                                                                                                                                                                          63
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Hyaluronate synthase; PmHAS; drug delivery; angiogenesis;
                                                                                                                                 02-APR-1998;
26-OCT-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                         P. multocida hyaluronate synthase (PmHAS) amino
N-PSDB; AAZ35589.
                 WPI; 2000-013032/01.
                                                                                                                                                                                           01-APR-1999;
                                                                                                                                                                                                                                                                     WO9951265-A1
                                                                                                                                                                                                                                                                                                           Pasturella multocida
                                                                                                                                                                                                                                                                                                                                             fowl cholera; shipping
                                                                                           (OKLA ) UNIV OKLAHOMA.
                                                                                                                                 98US-0080414.
98US-0178851.
                                                                                                                                                                                                                                                                                                                                                                 angiogenesis; wound healing; capsule synthesis
                                                                                                                                                                                           99WO-US07289
                                                                                                                                                                                                                                                                                                                                                 fever
                                                                                                                                                                                                                                                                                                                                                                                   hyaluronan; hyaluronic acid;
                                                                                                                                                                                                                                                                                                                                                                                                                            acid
                                                                                                                                                                                                                                                                                                                                                                                                                           sequence
                                                                                                                                                                                                                                                                                                                                                                                       cosmetic;
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stabilisation of recombinant proteins and in cosmetics. The HS nuclei acids can also be used to develop agents to block capsule synthesis t pathogens and act as antibiotics. The avirulent P. multocida strains containing the PmHAS nucleotide sequence which can be used to express PmHAS in a foreign host. The HS nucleic acids can be used for the production of HA. Also, specific changes to the HS coding sequence can result in the production of HA having a modified size distribution or structural configuration and functional properties. The HA products can be used in e.g. drug delivery, angiogenesis and wound healing. This is the Pasturella multocida hyaluronate synthase (PmHAS) amino aci sequence. Hyaluronic acid (HA) or hyaluronan, is a polysaccharide that serves both structural and recognition roles in higher animals. Bacteri produce extracellular capsules of HA which mimic their host HA and aid escape from a host immune response. The invention includes a vector vaccines for fowl cholera or shipping fever. nucleic Bacteria can acid can

and

vaccines

972 AA;

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Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   3 PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
                                                                                                                                                                                     GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSK------
                                                                                                                                                                                                                                                                                                                                                                                                                       PLVSIYIPAYNCANYIQRCVDSALNQTVVDLEVCICNDGSTDNTLEVINKLYGNNPRVRI 499
                                           QSLNRQGITYYNYDEFDDLDESRKYIFNKTAEYQEEIDILKDIKIIQNKDAKIAVSIFYP
                                                                                                                                                                                                                                                                             AWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRS--VIDG
                                                                                                                                                                                                                                                                                                                           MSKPN--GGIASASNAAVSFAK---GYYIGQLDSDDYLEPDAVELCLKEFLKDKTLAC--
                                                                                                                                                                                                                                                                                                                                                                       ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG
                                                                                                                                                                                                                                 ----VYTTNRNVNPDGSLIANGYNWPEFSREKLTTAMI----AHHFRMFTIRAWHLTDG
                                                                                                                                     -FNEKIENAVDYDMFLKLSEVGKFKHLNKICYNRVLHGDNTSIKKLGIQKKNHFVVVN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
                                                                                         - YNLQQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    11.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 209; DB 21;
Pred. No. 1.5e-12;
                                                                                         -RRTAW----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mismatches
-KIKEEIRAGYWK-AAGIAVGADCLNY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Indels 138;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                       660
                                                                                                                                                                                                                                                                             180
261
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Db 721 WILMSDAYKLINITEVHKNIEVIULHVEKNILZPDKKEILAPDIKKEILAPDIKY 780

Oy 262 --GILKSTAYALIEKALSOODIGCI-------RLEI----YEYFLSLEKYSLTDILDF 306

Db 781 TSHRLİKTEMHLSNINKLSQLMLACEYIIFDHHDSLFYKNDSYAY---KKXIDVGAMESA 337

OY 307 LTIRVMHKLSADOVEKILK 326

Db 838 LTHDMIEKINAHPEKKLIN 857

Search completed, December 2, 2002, 11:59:02

Job time: 35:9785 secs
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Result
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US-08-312-387B-3
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Local Similarity nes 337; Conserv

100.0%; Score 1764; DB 1; ilarity 100.0%; Pred. No. 1.2e-178; Conservative 0; Mismatches 0;

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US-08-312-387B-5 Sequence 5, Application US/08312387B Patent No. 554553 GENERAL INFORMATION: GENERAL INFORMATIO	28 201.5 11.4 702 4 US-09-437-277-1 29 199 11.3 324 1 US-08-597-236-10 30 199 11.3 324 1 US-08-597-236-10 31 185.5 10.5 281 4 US-08-961-083-196 32 162 9.2 674 4 US-08-961-083-200 33 152.5 8.6 93 4 US-08-858-207.3 Sequence 34 152 8.6 303 4 US-08-961-083-202 35 150 8.5 270 4 US-08-961-083-202 36 138 7.8 358 4 US-09-134-001C-5633 37 131.5 7.5 727 4 US-09-134-001C-4057 38 116.5 6.6 79 4 US-09-134-001C-4051 39 116 6.6 418 4 US-09-134-001C-4051 40 99.5 5.6 1410 4 US-09-568-102-3 42 99.5 5.6 1410 4 US-09-568-480-3 43 99.5 5.6 1410 4 US-09-568-486-3 44 99.5 5.6 1410 4 US-09-568-486-3 5 Sequence 5 Sequence 5 Sequence 5 Sequence 6 Sequence 7 Sequence 7 Sequence 7 Sequence 7 Sequence 8 Sequence 8 Sequence 9 Sequence
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INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
TYPE: amino acid
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Matches
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                                                                                                  Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            GENERAL INFORMATION:
                                                                                                                                                                                                                                                                       NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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TITLE OF INVENTION:
NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION: 536
PRIOR APPLICATION DATA:
APPLICATION UMBER: 08/312,387
FILING DATE: September 26, 199
CLASSIFICATION: 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
STREET: 411 Hackensack Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Gotschlich, Emil C.
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CITY: Hackensack
STATE: New Jerse
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                                                                                   Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER:
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            MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
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MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
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                                                                                   Similarity
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                                                              100.0%; ilarity 100.0%; Conservative 0;
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                                                              Score 1764; DB 1;
Pred. No. 1.2e-178;
Mismatches 0;
                                                                                                  Length
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                                                          Query Match
Best Local Similarity
Matches 337; Conserv
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Patent No. 5798233
GENERAL INFORMATION:
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TELEX: 133521
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                        SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acid
TYPE: amino acid
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APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Release #1.0, Version CURRENT APPLICATION DATA:
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MEDIUM TYPE: Floppy
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CORRESPONDENCE ADDRESS:
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CITY: H
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TELEPHONE: 201 343-1684
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CLASSIFICATION: 435
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
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                                                            Score 1764; DB 1;
Pred. No. 1.2e-178;
0; Mismatches 0;
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                                                                        ; MOLECULE TYPE: US-08-878-360-5
                                                                                                                     TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO: 5:
SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
TYPE: amino acid
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GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
                  Query Match
Best Local Similarity
   Matches
                                                                                                                                                                                                                               NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
NUMBER OF SEQUENCES: 12
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FILING DATE: 18-JUN-1997
CLASSIFICATION: 435
PRIOR APPLICATION DATA:
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MEDIUM TYPE: Floppy disk
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ADDRESSEE: Klauber & Jackson
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                                                                                                                                                                                                                                                                                                                                            APPLICATION NUMBER: 08/312,387 FILING DATE: September 26, 1994 CLASSIFICATION: 435
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OPERATING SYSTEM: SOFTWARE: PatentI
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STATE: New Jersey
                                                                                                           TOPOLOGY:
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100.0%; Score 1764; DB 2; ilarity 100.0%; Pred. No. 1.2e-178; Conservative 0; Mismatches 0;
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                                                                                                         linear
                                                                                       protein
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                                     Length 337;
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                                                                       ; MOLECULE TYPE: protein ; SEQUENCE DESCRIPTION: ; US-09-333-412-5
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 5, Application US/09333412 Patent No. 6342382 GENERAL INFORMATION:
Query Match
Best Local Similarity
Matches 337; Conserv
                                                                                                                                                                                                    TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO: 5:
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                                                                                                                                                                                                                                                                                                                                                                                                                              COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
CLASSIFICATION: <Unknown>
                                                                                                                                               SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
TYPE: amino acid
                                                                                                                                                                                                                                                                                                                                                        PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNEY/AGENT INFORMATION:
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MEDIUM TYPE: Floppy disk
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            APPLICANT: Gotschlich, Emil C.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CITY: Hackensack
STATE: New Jersey
COUNTRY: USA
                                                                                                                                                                                                                                                                                                 NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ZIP: 0760
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100.0%; ilarity 100.0%; Conservative 0
                                                                                           SEQ
Score 1764; DB 4;
Pred. No. 1.2e-178;
Mismatches 0;
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                                  Length 337;
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US-08-312-387B-12
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                                                Matches
                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Patent No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         GENERAL INFORMATION: APPLICANT: Gotsch
                                                                                                                                                                             TELEX: 133521
INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
                                                                                                                                                                                                                                                            NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742 REFERENCE/DOCKET NUMBER: 600 TELECOMMUNICATION INFORMATION: TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/312,387B
FILING DATE: U11y 7, 1994
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM NUMBER OF SEQUENCES: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                               MOLECULE TYPE:
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                                                                                                                                                                                                                              TELEPHONE: ZU1 301 1684
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                                                                                                                                               TOPOLOGY:
                                                                                                                                                            TYPE: amino acid
                                                                 Local
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1 MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
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                                                               99.8%;
Similarity 99.7%;
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VENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
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                                                Conservative
                                                                                                                                             linear
                                                                                                                              protein
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                                                1; Mismatches
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                                             Score 1761; DB 1;
Pred. No. 2.4e-178;
1; Mismatches 0;
                                                                             Length 337;
                                                Indels
                                               0;
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1 MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60

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RESULT 7
US-08-683-426-12
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   Matches
                               Query Match
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                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                          NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
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                                                                                                                             SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
                                                                                                                                                                                                                                                                                       CLASSIFICATION: 536
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                        CLASSIFICATION: 536 PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                   COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOCTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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CORRESPONDENCE ADDRESS:
                                                                               MOLECULE TYPE: protein
                                                                                                                                                                  TELEFAX: 20-
TELEFAX: 133521
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                                                                                           TYPE: amino aciu
TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                   APPLICATION NUMBER: 08/312,387 FILING DATE: September 26, 1994
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   Local Similarity
mes 336; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                        APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MEDIUM TYPE:
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   Conservative
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                  99.8%;
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Score 1761; DB 1;
Pred. No. 2.4e-178;
1; Mismatches 0;
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                               Length 337;
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   Indels
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RESULT 8
US-08-683-458-12
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; MOLECULE TYPE:
US-08-683-458-12
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                 Query Match
Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENERAL INFORMATION:
                                                                                                                                                     TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING T
                                                                                                                       SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
                                                                                                                                                                                                 ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095A
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                             PRIOR APPLICATION DATA:
APPLICATION NUMBER:
FILING DATE: Septemb
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                        SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/683,458
                                                                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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CORRESPONDENCE ADDRESS:
                                                                                                                                                                                 ELECUPETE 201
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STATE: New Jersey
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                          FILING DATE:
CLASSIFICATION: 435
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              99.8%;
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Score 1761; D
Pred. No. 2.4e
1; Mismatches
                .4e-178;
                                DB 1;
                            Length 337;
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                                                                               TELEX: 133521
INFORMATION FOR SEQ ID NO:
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APPLICANT: Gotsch
                                                                                                                                                                                               FILING DATE:
APPLICATION NUMBER: 08/31:
FILING DATE: September 26.
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David
TYPE: amino in TOPOLOGY: li
                                                                                                                           NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                 SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
                                                                                                                                                                                                                                                                                                                                                                           COMPUTER: IBM PC Compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING
                                                                                                                                                                                                                                                                                                PRIOR APPLICATION DATA:
APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          301 TDLLDFLTDRVMRKLFAAPQYRKILKKMLRPWKYRSY 337
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                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: US/08/878,360 FILING DATE: 18-JUN-1997 CLASSIFICATION: 435
                                                                                                TELEPHONE: ZUL ... TELEPHONE: ZUL ... 1684
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STATE: New Jersey
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   protein
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Query Match

99.8%;

Score 1761;

DB 2;

Length 337;

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US-08-478-140B-5
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US-08-478-140B-5
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GENERAL INFORMATION:
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Matches 336; Conservative
                                                                                                                                                                                                                                                                                                  ZIP: 10036-2711
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1 0
                                                                          TELEX: 66141 PENNIE INFORMATION FOR SEQ ID NO: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: ROTH, STEPHANIE L.
APPLICANT: BUCZALA, STEPHANIE L.
TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
                                                                                                                                                                                     CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/478,140B
FILING DATE: 07-UN-1995
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Laura A. Coruzzi
REGISTRATION NUMBER: 30,742
               MOLECULE TYPE:
                                                                                                                                         REFERENCE/DOCKET NUMBER: 71
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 790-9090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT:
                                                                                                                                                                                                                                                                                                                                                                                                          STREET: 1155 Ave
CITY: New York
STATE: New York
COUNTRY: USA
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                            TYPE: amino acid TOPOLOGY: linear
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                                                              337 amino acids
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                                                                                                                             (212) 869-9741/8864
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1; Mismatches 0;
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RESULT 11
US-09-333-412-12
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Sequence 12, Application.
Sequence 12, Application.
Patent No. 6342382
; GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
APPLICANT: GOTSCHLICH, EMIL C.
OLIGOSACCHARIDES, AND GENES ENCODING THEM
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US-09-333-412-12
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Best Local :
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                                                                                               INFORMATION FOR SEQ ID NO: 12:
SEQUENCE CHARACTERISTICS:
LENGTH: 337 amino acids
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                                                                                                                                                                                                   ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esg., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
CLASSIFICATION: -Unknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ZIP: 07601
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                 MOLECULE TYPE: protein SEQUENCE DESCRIPTION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
                                      MOLECULE TYPE:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0
                                                                              TYPE: amino acid
                                                                                                                                                                                                                                                                                                                          APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CITY: Hackensack
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STREET: 411 Hackensack Avenue
                                                                                                                                                               TELEX: 133521
                                                                                                                                                                                  TELEFAX: 201
                                                         TOPOLOGY:
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                   SEQ
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                     ID NO:
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US-09-338-943-5
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Patent No. 6379933
GENERAL INFORMATION:
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Best Local Similarity
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                                      TELEX: 66141 PENNIE INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT:
APPLICANT:
                                                                                                                                                                                                                                                                                                            COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: LIBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        APPLICANT: BUCZALA, STEPHANIE L.

TITLE OF INVENTION: METHOD OF TRANSFERRING AT LEAST TWO
TITLE OF INVENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
TITLE OF INVENTION: POLYGLYCOSYLTRANSFERASE
                    SEQUENCE CHARACTERISTICS:
                                                                      REPERENCE/DOCKET NUMBER: 718
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 790-9090
TELEPAX: (212) 869-9741/8864
                                                                                                                                                                                    FILING DATE: ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                        CLASSIFICATION:
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     301
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                                                                                                                                            NAME: Laura A. Coruzzi
REGISTRATION NUMBER: 30,742
                                                                                                                                                                                                                                                                              APPLICATION NUMBER: FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61 RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
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                                                                                                                                                                                                                         APPLICATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ADDRESSEE:
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   amino acids
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of the Americas
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                                                                                                                                 7188-017
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Pred. No. 2.4e-178;
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US-08-312-387B-3
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                                                                                     TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO:
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                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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TITLE OF INVENTION:
NUMBER OF SEQUENCES:
                                                                    SEQUENCE CHARACTERISTICS:
                                                                                                                                              TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                               ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM: MEDIUM TYPE: Floppy
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MOLECULE TYPE:
                                                                                                                                                                                                                                                                                                                                                                                                                       COUNTRY: U
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                                                                                                          TELEPHONE: ZUL TELEPHONE: ZUL TELEPHONE: ZUL TELEPHONE: 201 343-1684
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                   TOPOLOGY:
                                TYPE: amino acid
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                                                     LENGTH:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                             New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             411 Hackensack Avenue
                                                     348 amino acids
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IVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF IVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM SEQUENCES: 12
                 linear
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                                                                                                                                                                                                                                                                                                                                                                                       Floppy disk
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                                                                                                                                                                                                                                                                                           US/08/312,387B
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Pred. No. 2.4e-178;
1; Mismatches 0;
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        TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
TELEX: 13521
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
LENGTH: 348 amino acids
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 3, Application US/08683426 Patent No. 5705367 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Ouery Match 59.5%; Score 1049; DB 1; Best Local Similarity 64.5%; Pred. No. 7.3e-103; Matches 214; Conservative 33; Mismatches 83;
                                                                                                                                                              ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600
                                                                                                                                                                                                                                                                                                                                                                       COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/683,426
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               COMPUTER READABLE FORM: MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
Rlauber & Jackson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERAS
TITLE OF INVENTION: OLIGOSACCHARIDES,
                                                                                                                       TELECOMMUNICATION INFORMATION: TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                                           FILING DATE: 536 CLASSIFICATION: 536 PRIOR APPLICATION DATA:
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                                                                                                                                                                                                                                              APPLICATION NUMBER: FILING DATE: Septem CLASSIFICATION: 536
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               CITY: Hackensack
STATE: New Jersey
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TYPE:
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  amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             411 Hackensack Avenue
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                                                                                                                                                                                                                                                                    September 26, 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
                                                                                                                                                                                                                                                                                       08/312,387
                                                                                                                                                                  600-1-095B
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US-08-683-458-3
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Best Local Similarity
Matches 214; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Sequence 3, Application US/08683458 Patent No. 5798233
          TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
                                                                                                                                        APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 1994
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THE
                                                                                                 TELECOMMUNICATION INFORMATION: TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: (FILING DATE: CLASSIFICATION: 435
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 301 PSGAWLDFAADGRMRRLFTLRQYFGILYRLIK 332
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                                                            TELEPHONE: 201 %.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          CITY: Hackensack
STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 KILAQAQNSGLIPSLNIGLDELAKSGGGGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 120
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STREET: 411 Hackensack Avenue
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LENGTH:
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Search completed: December 2, 2002, 12:03:15 Job time: 13.544 secs
                                                                                                                                                                                                                                                                                                                                              Query Match 59.5%; Score 1049; DB 1; Length 348; Best Local Similarity 64.5%; Pred. No. 7.3e-103; Matches 214; Conservative 33; Mismatches 83; Indels 2;
                                                                                                                                                                                                179 DGGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYREHQDQTSSKYNLQQRRTAWKI 238
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181 DGGLRYDTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGI 240
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Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
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Maximum DB
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Perfect score:
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        Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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194
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187.5
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1: /cgn2_6/ptodata/1/pubpaa/U
2: /cgn2_6/ptodata/1/pubpaa/U
3: /cgn2_6/ptodata/1/pubpaa/U
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9: /cgn2_6/ptodata/1/pubpaa/U
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length: 2000000000
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Gapop 10.0 , Gapext 0.5
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1764
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// cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep: *
// cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep: *
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// cgn2_6/ptodata/1/pubpaa/US07_NEW_PUB.pep: *
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// cgn2_6/ptodata/1/pubpaa/US08_PUBCOMB.pep: *
// cgn2_6/ptodata/1/pubpaa/US09_PUBCOMB.pep: *
// cgn2_6/ptodata/1/pubpaa/US00_NEW_PUB.pep: *
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     DB
     12 US-10-007-267-5
12 US-10-007-267-12
12 US-10-007-267-13
12 US-10-007-267-13
12 US-09-24-358-29
12 US-09-767-041-22
13 US-09-767-041-36
13 US-09-767-041-36
13 US-09-767-041-34
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19 US-09-767-041-47
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Sequence 5, Appli
Sequence 12, Appli
Sequence 11, Appl
Sequence 29, Appl
Sequence 29, Appl
Sequence 31, Appl
Sequence 36, Appl
Sequence 37, Appl
Sequence 37, Appl
Sequence 27, Appl
Sequence 27, Appl
Sequence 39, Appl
Sequence 196, App
Sequence 196, Appl
Sequence 1, Appl
Sequence 1, Appl
Sequence 2, Appl
                                                                                                                                                                                                                                                                                      Description
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US-10-007-267-5
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92	93	94.5	95	95	95	95	98	103	105	105	108	116.5	116.5	123	127	145	147.5	147.5	147.5	150	152	152	152	152	162
5.2	5.3	5.4	5.4	5.4	5.4	5.4	5.6	5.8	6.0	6.0	6.1	6. 6	6.6	٠	7.2	8.2	8.4	8.4		8.5	8.6				9.2
963	844	626	639	639	639	306	324	612	573	358	418	269	79	809	256	389	187	187	187	270	715	706	303	120	674
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US-09-801-368-74	US-10-108-605-185	- 1	US-10-052-586-364	US-09-792-451-2	US-09-789-417-2	us-09-912-020-275	US-09-981-876-181	US-10-001-851-25	US-09-815-242-12474	US-09-815-242-5714	US-09-816-028A-33	US-09-767-041-41	US-09-765-272-168	US-09-924-358-8	US-09-925-301-883	US-09-816-028A-34	US-10-074-527-4 .	US-09-815-028-7	US-09-973-457-4	US-09-765-272-198	US-09-815-242-10511	US-09-815-242-4950	,	_	US-09-765-272-200
•	Sequence 185, App	•	Sequence 364, App	Sequence 2, Appli	Sequence 2, Appli	Sequence 275, App	181,	Sequence 25, Appl	Sequence 12474, A	Sequence 5714, Ap	Sequence 33, Appl	Sequence 41, Appl	168	Sequence 8, Appli	Sequence 883, App	Sequence 34, Appl	Sequence 4, Appli	Sequence 7, Appli	Sequence 4, Appli	Sequence 198, App	11,	×	Sequence 202, App		Sequence 200, App

ALIGNMENTS

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Sequence 5, Application US/10007267
Patent No. US20020127682A1
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
APPLICANT: Gotschlich, Emil C.
OLIGOSACCHARIDES, AND GENES ENCODING THEM
OLIGOSACCHARIDES, AND GENES ENCODING THEM
                                                  INFORMATION FOR SEQ ID NO: 5: SEQUENCE CHARACTERISTICS:
                                                                                                                                                   NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                              APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
APPLICATION NUMBER: 08/312,387
EILING DATE: July 7, 1994
ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ZIP: 07601
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PAtentin Release #1.0,
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION DATA:
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                                                                                                                                                                                                                                                                                                                                                                                                                                     APPLICATION NUMBER: US/10/007,267
FILING DATE: 03-Dec-2001
CLASSIFICATION: <Unknown>
                                                                                                     TELEX: 133521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE: New Jersey COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STREET: 411 Hackensack Avenue CITY: Hackensack
TYPE: amino acids
                                                                                                                              TELEFAX: 201 343-1684
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US-10-007-267-12
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Patent No. US20020127682A1
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C
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Best Local Similarity 100.0%;
Matches 337; Conservative (
TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO: 12:
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                                                                                                                                         APPLICATION NUMBER: US/10/007,267
FILING DATE: 03-Dec-2001
CLASSIFICATION: CUNKNOWN>
PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
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REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
                                                                                                                                                                                                                                                                                                                                  COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                            ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                         CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                              CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NUMBER OF SEQUENCES:
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                                                                                                                                                                                                                                                                                    COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                  CITY: Hackensack
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Gotschlich, Emil C.
NVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
OLIGOSACCHARIDES, AND GENES ENCODING THEM
                                                                                                                                                                                                                                                                                                                                                                                   USA
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Pred. No. 1.7e-166;
; Mismatches 0;
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RESULT 3
US-10-007-267-3
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Patent No. US20020127682A1
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C.
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Best Local Similarity
Matches 336; Conser
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             PRIOR APPLICATION DATA:

APPLICATION NUMBER: US/09/33,412

FILING DATE: 15-Jun-1999

APPLICATION NUMBER: 08/312,387

FILING DATE: July 7, 1994

ATTORNEY,AGENT INFORMATION:

NAME: Jackson Esq., David A.

REGISTRATION NUMBER: 26,742

REFERENCE/DOCKET NUMBER: 600-1-095

TELECOMMUNICATION INFORMATION:
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                                                                                                                                                                                                     COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION UNMBER: US/10/007,267
FILING DATE: 03-Dec-2001
CLASSIFICATION: <Unknown>
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MOLECULE TYPE: protein
SEQUENCE DESCRIPTION: SEQ ID NO: 12:
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LENGTH: 337 amino acids
TYPE: amino acid
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: GLYCOSYLTRANSFERASES
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                                                                                                                                                                                                                                                                                                                                                                                                                      STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                    ADDRESSEE: Klauber & Jackson STREET: 411 Hackensack Avenue CITY: Hackensack
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Pred. No. 3.4e-166;
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TELEFAX: 201 343-1684

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US-10-007-267-11
Sequence 11, Application US/10007267; Patent No. US20020127682A1
GENERAL INFORMATION:
APPLICANT: Gotschlich, Emil C
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Best Local
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INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
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                                                                                     PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-1999
                              APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994 ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                               COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: Patentin Release #1.0, Version CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                         COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                    NUMBER OF SEQUENCES: 12
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE DESCRIPTION: SEQ ID NO:
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                                                                                                                                          APPLICATION NUMBER: US/10/007,267 FILING DATE: 03-Dec-2001 CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE: Klauber & Jackson
STREET: 411 Hackensack Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              LENGTH: 348 amino acids TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                               ZIP: 07601
                                                                                                                                                                                                                                                                                                                            COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                               STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                CITY: Hackensack
REGISTRATION NUMBER:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
Jackson Esq., David A. TRATION NUMBER: 26,742
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PRIOR APPLICATION NUMBER: US 60/229,300
PRIOR FILING DATE: 2000-09-01
NUMBER OF SEQ ID NOS: 52
SOFTWARE: FRASTSEQ for Windows Version 4.0
SEQ ID NO 29
LENGTH: 150
TYPE: PRT
ORGANISM: Artificial Sequence
FEATURE:
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MOLECULE TYPE: protein

SEQUENCE DESCRIPTION: SEQ ID NO: 11:
US-10-007-267-11
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                                                                        ; OTHER INFORMATION: Consensus amino acid US-09-924-358-29
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-924-358-29
                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
APPLICANT: Millennium Pharmaceuticals, Inc.
APPLICANT: Millennium Pharmaceuticals, Inc.
APPLICANT: Meyers, Rachel
APPLICANT: MacBeth, Kyle
TITLE OF INVENTION: 26199, 33530, 33949, 47148, 50226, AND
TITLE OF INVENTION: 58764,
TITLE OF INVENTION: NOVEL HUMAN TRANSFERASE FAMILY MEMBERS
FILE REFERENCE: 38155-20034.00
CURRENT APPLICATION UNMERE: US/09/924,358
CURRENT FILING DATE: 2001-08-06
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Sequence 29, Application US/09924358 Patent No. US20020107376A1
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                 Query Match
Best Local Similarity
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INFORMATION FOR SEQ ID NO: 11:
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TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
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LENGTH: 348 amino acids
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SLTDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               LQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAKDFQKRDSRI 60
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 Conservative
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                 12.4%; Score 218; DB 10; 40.0%; Pred. No. 2.2e-14;
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 Mismatches
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                                                                                                                                                                                                                                                                                                                                   FAMILY MEMBERS
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                                  Length 150;
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LENGTH: 972
TYPE: PRT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Weigel, Paul H
APPLICANT: Weigel, Paul H
APPLICANT: Weigel, Kshama
APPLICANT: DeAngelis, Paul
TITLE OF INVENTION: STREPTOCOCCUS EQUISIMILIS HYALURONAN SYNTHASE GENE AND EXPRESSION
TITLE OF INVENTION: IN BACILLUS SUBTILIS
FILE REFERENCE: 3554.049
CURRENT APPLICATION NUMBER: US/09/879,959
CURRENT FILING DATE: 2001-09-12
PRIOR APPLICATION NUMBER: 09/469,200
PRIOR APPLICATION NUMBER: 09/178,851
PRIOR FILING DATE: 1999-12-21
PRIOR APPLICATION UMBER: 09/178,851
PRIOR PRIOR APPLICATION NUMBER: 09/178,851
PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR PRIOR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  3 PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
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   LTHDWIEKINAHPPFKKLIK
                                                              LTDRVMRKLFAAPQYRKILK 326
                                                                                                                       TSNRLIKTEAHLSNINKLSQLNLNCEYIIFDNHDSLFVKNDSYAY---MKKYDVGMNFSA 837
                                                                                                                                                                                                                                                                                                                                                                     QSLNRQGITYYNYDEFDDLDESRKYIFNKTAEYQEEIDILKDIKIIQNKDAKIAVSIFYP 720
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MSKPN--GGIASASNAAVSFAK---GYYIGQLDSDDYLEPDAVELCLKEFLKDKTLAC-- 552
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 122
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                                                                                                                                                                                  ---GLLKSTAYALYEKALSGQDIGCL------RLFL----YEYFLSLEKYSLTDLLDF 306
                                                                                                                                                                                                                                                 NTLNGLVKKLNNIIEYNKNIFVIVLHVDKNHLTPDIKKEILAFYHKHQVNILLNNDISYY
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSK---------
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                                                                                                                                                                                                                                                                                                                                                                                                                                    -----YNLQQ------RRTAW------
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60; Mismatches 146;
                                                                                                                                                                                                                                                                                                          -----KIKEEIRAGYWK-AAGIAVGADCLNY 261
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                                                                                                                                                                                                                                                                       RESULT 8
US-09-767-041-36
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US-09-767-041-22
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PRIOR APPLICATION NUMBER: US/09/767,041
CURRENT FILING DATE: 2001-01-22
PRIOR APPLICATION NUMBER: PCT/NL99/00460
PRIOR FILING DATE: 1999-07-19
PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR APPLICATION NUMBER: EP98202467.1
PRIOR FILING DATE: 1998-07-22
PRIOR FILING DATE: 1998-07-22
NUMBER OF SEO ID NOS: 53
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LENGTH: 332
TYPE: PRT
                                                                                                                                                GENERAL INFORMATION: APPLICANT: Smith,
                                                                                                                                                                                                            Sequence 36, Application US/09767041 Patent No. US20020055168A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 82; Conserv
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                            TITLE OF INVENTION: STREPTOCOCCUS SUIS VACCINES AND DIAGNOSTIC TESTS FILE REFERENCE: 2183-4726 CURRENT APPLICATION NUMBER: US/09/767,041 CURRENT FILING DATE: 2001-01-22
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   PRIOR APPLICATION NUMBER:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         273 KKLQTLFRIVYKQLKQNKRLALLMNAYYLVGCLHL-NFSVFLKTGK------DKIQERL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              266 ---STAYALYEKALSGQD------IGCLRLFLYEYFLSLEKYSLTDLLDFLTDRV
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      212 --ALVKYRFH--QDQTSSKYNLQQRRTAWKIKEEIRAGYWKAAGIAVGADCLNYGLLK--
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          165 PIHNNTMIMRRSVIDGGLRFDPAYIHAED---YKFWYEAGKLG----RLAYYPE-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5 VSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRIIS 64
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PCT/NL99/00460
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NAME/KEY: misc_feature
OTHER INFORMATION: CPS1
US-09-767-041-36
                                                                                                                     ; OTHER INFORMATION: beta-1,3 galactosyl transferase from C. jejuni US-09-816-028A-31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               US-09-816-028A-31
                                                                                                                                                                                                                 SEQ ID NO 31
LENGTH: 297
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SEQ ID NO 36
                                                         Query Match
Best Local Similarity
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APPLICANT: Wakarchuk, Warren W.
APPLICANT: Wakarchuk, Warren W.
APPLICANT: Watonal Research Council of Canada
TITLE OF INVENTION: Campylobacter Glycosyltransferases for Biosynthesis
TITLE OF INVENTION: Gangilosides and Ganglioside Mimics
FILE REFERENCE: 019633-000111US
CURRENT APPLICATION NUMBER: US/09/816,028A
CURRENT FILING DATE: 2001-03-21
                                                                                                                                                                                                                                                                       PRIOR APPLICATION NUMBER: US 60/118,213
PRIOR FILING DATE: 1999-02-01
PRIOR APPLICATION NUMBER: US 09/495,406
PRIOR FILING DATE: 2000-01-31
NUMBER OF SEQ ID NOS: 49
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PRIOR APPLICATION NUMBER:
PRIOR FILING DATE: 1998-
PRIOR APPLICATION NUMBER:
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NUMBER OF SEQ ID NOS:
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TYPE: PRT
ORGANISM: Streptococcus
                                                                                                                                                                          TYPE: PRT
ORGANISM: Campylobacter jejuni
                                                                                                                                                        FEATURE:
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Local Similarity 25.2%;
5 VSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRIIS 64
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                                       Conservative
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                                                       11.0%; 21.8%;
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                                  Score 194; DB 10;
Pred. No. 1.4e-11;
6; Mismatches 108
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                                                                       Length 297;
                                       Indels 126;
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; NAME/KEY: misc_feature
; OTHER INFORMATION: CPS1J
US-09-767-041-35
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CURRENT FILING DATE: 2001-01-22
PRIOR APPLICATION NUMBER: PCT/NL99/00460
PRIOR FILING DATE: 1999-07-19
PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR FILING DATE: 1998-07-22
PRIOR FILING DATE: 1998-07-22
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US-09-767-041-35
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SOFTWARE: PatentIn v
SEQ ID NO 35
LENGTH: 322
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Best Local Similarity 23.4%;
Matches 81; Conservative 55
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence 35, Application UP Patent No. US20020055168A1
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                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: PRT ORGANISM: Streptococcus
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                                                                                                                                                                                                                   5 VSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI--
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                                                                      IIAMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSV 177
                                                                                                                                                                                   ISVIVPVYNVDKYLSSCIESIINQNYKNIEILLIDDGSVDDSAKICKEY-EKDKRVKIFF 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        QYRKILKKMLR 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               NYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSLTDLLDFLTDRVMRKLFAAP
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ID-GGLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSK---YNLQQRR 233
                                                                                                                                               ----ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRS 117
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---LLKKMQY-----NYNFNLTLLKLIEYFLLIEKYSLSSKRNVLCFKI--NIF---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            QEKCYVKKDFLKELLKTKNLFWTVWAKVIKKELYLKAVGLISLENAKINMAEDVLLYYPL
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                                                                                                            TNHSGVSNARNHGI-------KRSTAEYIMFVDSDDVVDSRLVEKLYFNIIKSRS 110
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                                                                                                                                                                                                                                                                           Score 188; DB 1
Pred. No. 6e-11;
                                                                                                                                                                                                                                                  Mismatches
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                                                                                                                                                                                                                                                                                              DB 10; Length 322;
                                      ----FEVNNP--NIDFEAINTV 142
                                                                                                                                                                                                                                                           132;
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US-09-816-028A-27
Sequence 27, Application US/09816028A
Patent No. US20020042369A1
GENERAL INFORMATION:
APPLICANT: Gilbert, Michel
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Best Local Similarity
"~+~hes 73; Conserve
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US-09-767-041-34
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SEQ ID NO 34
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APPLICANT: Wakarchuk, Warren W.
APPLICANT: National Research Council of Canada
TITLE OF INVENTION: Campylobacter Glycosyltransferases for
TITLE OF INVENTION: Gangliosides and Ganglioside Minics
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRIOR FILING DATE: 1998-07-22
NUMBER OF SEQ ID NOS: 53
SOFTWARE: PatentIn version 3.0
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CURRENT FILING DATE: 2001-01-22
PRIOR APPLICATION NUMBER: PCT/NL99/0046
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PRIOR FILING DATE: 1998-07-22
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                                                                                                                                                                                                                                                 YYNYVIRNSSLINQKFSINNIDLVTRLENYPFKLKREF-SHYFDAKVIKEKVKCLN
                                                                                                                                                                                                                                                                                         KYNLQQRRTA-----
                                                                                                                                                                                                                                                                                                                                VWCKLYSRDII-------KDIKFQINNRSIGEDLLFNLEVLNNVTRVVVDTREY
                                                                                                                                                                                                                                                                                                                                                                                                                                                     MGAWLEV---LSEENNKSVLAAIARNGAIWDKPTRH-----EDIVAVFPFGNPIHNN 169
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    TAWKIKEEIRAGYWKAAGIAVGADCLNYGL-----LKSTAYALYEKALSGQDI-----
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                                                                                                                                                                                                                                                                                                                                                                                                               ----EIDFCLVDENG------YTKKKRNSNFHVLTREETVKEFLSGSNIENN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KYYKK-INGGLADARNFGLEHAT----GKYIAFVDSDDYIEVAMFERMHDNITEYNADIA 115
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MNDLISVIVPIYNVQDYLDKCINSIINQTYTNLEVILVNDGSTDDSEKICLNYMKNDGRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           322
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 187.5; DB Pred. No. 6.7e-11
                                                                                                                                                                                                                                                                                       -----WKIKEEIRAGYWKAAGIAVGADCLN 260
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                     Biosynthesis
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RESULT 13
US-09-767-041-51
; Sequence 51, Application US/09767041
; Patent No. US20020055168A1
                                                                           ; NAME/KEY: misc_feature
; OTHER INFORMATION: N-terminal part of CPS2J
US-09-767-041-51
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US-09-816-028A-27
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SEQ ID NO 51
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SEQ ID NO 27
LENGTH: 301
TYPE: PRT
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   Matches
                       Best
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CURRENT FILING DATE: 2001-01-22
PRIOR APPLICATION NUMBER: PCT/NL99/0046
PRIOR FILING DATE: 1999-07-19
PRIOR APPLICATION NUMBER: EP98202465.5
PRIOR FILING DATE: 1998-07-22
PRIOR FILING DATE: 1998-07-22
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION NUMBER: US 09/495,406
PRIOR FILING DATE: 2000-01-31
NUMBER OF SEQ ID NOS: 49
                                                                                                                                                                                                                             NUMBER OF SEQ ID NOS:
SOFTWARE: Patentin v
                                                                                                                                                                                                                                                                  PRIOR FILING DATE:
                                                                                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: EP98
PRIOR FILING DATE: 1998-07-22
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                                                                                                                                                                                                                                                                                                                                                                                                                           FILE REFERENCE:
                                                                                                                                  ORGANISM: Streptococcus FEATURE:
                                                                                                                                                                         TYPE: PRT
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                                                                                                                                                                                         LENGTH: 120
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                     Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ISIILPTYNVEQYIARAIESCINQTFKDIEIIVVDDCGNDNSINIAKEYSKKDKRIKIIH
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   39;
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                     Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Smith, Hilda
 Conservative
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                                                                                                                                                                                                                             version 3.0
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                 10.5%;
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 29;
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Pred. No. 6.9e-11;
                 Score 185.5; DB 1
Pred. No. 2.6e-11;
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Mismatches
                                   DB 10;
 38;
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 Indels
                                     Length
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(LOS)
 19;
Gaps
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RESULT 15
US-09-765-272-196
; Sequence 196, Application US/09765272
; Patent No. US20020061545A1
; GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  US-09-816-028A-39

; Sequence 39, Application US/09816028A

; Patent No. US2002042369A1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ; FEATURE:
OTHER INFORMATION: glycosyltransferase from C. jejuni OH4384 (ORF 12a; OTHER INFORMATION: of lipooligosaccharide (LOS) biosynthesis locus) US-09-816-028A-39
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SEQ ID NO 39
LENGTH: 270
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Wakarchuk, Warren W.
APPLICANT: National Research Council of Canada
APPLICANT: National Research Council of Canada
TITLE OF INVENTION: Campylobacter Glycosyltransferases for Biosynthesis of
TITLE OF INVENTION: Gangliosides and Ganglioside Mimics
FILE REFERENCE: 019633-000111US
CURRENT FILING DATE: 2001-03-21
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: US 60/118, 213
PRIOR APPLICATION NUMBER: US 60/118, 213
PRIOR APPLICATION NUMBER: US 09/495,406
PRIOR FILING DATE: 2000-01-31
NUMBER OF SEQ ID NOS: 49
COLUMN OF SEQ ID NOS: 49
COLUMN OF SEQ ID NOS: 49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Gilbert, Michel
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ORGANISM: Campylobacter jejuni
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: PRT
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Match 10.5%; Score 185.5; DB 10; Length 270; Local Similarity 21.3%; Pred. No. 8.3e-11; hes 65; Conservative 48; Mismatches 79; Indels 113;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 64 LPNGGVSNARNYGI --
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                                                                                                                                                               EKIAV 200
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                                                                                                                                                                                                                                                                                                                                          -FD-AFVHRVKTKQF--
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDGGL 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            FQNEENLGTFASRNLGV----LHSSSDFIMFLDSDDFLTPDACEIAFKEMKKGFDLLC-- 115
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                                                                                                                                                                                                                                                  AKCFKKDIILKSFEKIKIDERLNYGEDV----LFCYIYFMFC 195
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                                                                       Search completed: December Job time: 7.75447 secs
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TELEFAX: (301) 309-85 INFORMATION FOR SEQ ID NO: 196: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   134
                                                                                                                                                                                                                                                                                                                                                                                                                           121 VEELAIQEIMNRQAGDW-KFNSSAFILPTFKLIKKELFNEVH-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          64 ---GEYITIVDSDDIVKENMIETLYQQVQEKDADVVIGNYYNYDESDGNFYFYVTGQDFC 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity les 75; Conserv
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TITLE OF INVENTION: Streptococcus pneumoniae Antigens and Vaccines
NUMBER OF SEQUENCES: 452
CORRESPONDENCE ADDRESS:
ADDRESSEE: Human Genome Sciences, Inc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: 08/961,083
FILING DATE: <UNKNOWN>
ATTORNEY/AGENT INFORMATION:
NAME: Brookes, A. Anders
REGISTRATION NUMBER: 36,373
REFERENCE/DOCKET NUMBER: PB340
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICATION NUMBER: US/09/765,272
FILING DATE: 22-Jan-2001
CLASSIFICATION: -CURROWN>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette, 3.50 inch, 1.4Mb storage
COMPUTER: HP Vectra 486/33
OPERATING SYSTEM: MSDOS version 6.2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID NO: 196:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SOFTWARE: ASCII Text CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           TELECOMMUNICATION INFORMATION:
                                                                                                                                                             HQLTDTEEYKDICFRLKLFFDAEQR
                                                                                                                                                                                               YSLTDLLDFLTDRVMRKLFAAPQYR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMGAWLEVLSEENN------ 133
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ILKQTYQNIEIILVDDGSTDNSGEICDAFMMQDNRVRVLHQENKGGAAQAKNMGI-SVAK 63
                                                                                                                                                                                                                                                                                                                                      D---EATMHREYLLASK---IVFINDNLYLYR---
                                                                                                                                                                                                                                                                                                                                                                              PAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKEEIRAG 245
                                                                                                                                                                                                                                                                                                                                                                                                                                                               ---KSVLAAIARNGAIWDKPTRHEDIVAVF----PFGNPIHNNTMIMRRSVIDGGLRFD 185
                                                                                                                                                                                                                                                  -WARDIVEVFSKKISDCV----
                                                                                                                                                                                                                                                                                         YWKAAGIAVG----ADCLNYGLLKSTAYALYEKALSGQDIGCLRL----FLYEYFLSLEK 297
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TOPOLOGY: linear
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STATE: Maryland
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Length 281;

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Gaps

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Minimum I
Maximum I
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No.
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Maximum Match 100%
Listing first 45 summaries
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Perfect score:
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      Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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seq length: 2000000000
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1764
1 MQPLVSVLICAYNA
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Match
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1: pir1:*
2: pir2:*
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A; Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli, R. A; Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC58. A; Reference number: A81000; MUID: 20175755; PMID: 10710307
A; Accession: D81027
                                                                          A;Cross-references: GB:AL162753; A;Experimental source: serogroup C;Genetics:
                                                                                                                                                                                      A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z2491. A;Reference number: A81775; MUID:20222556; PMID:10761919 A;Accession: H81970
                                                                                                                                                                                                                                                 R;Parkhill, J.; Achtman, M.; James, K.D.; Bentley, ; Holroyd, S.; Jagels, K.; Leather, S.; Moule, S.; Nature 404, 502-506, 2000
                                                                                                                                                                                                                                                                                                      lacto-N-neotetraose biosynthesis glycosyl transferase NMA0524 [imported] - Neisseria C;Species: Neisseria meningitidis C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001 C;Accession: H81970
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C;Superfamily: Neisseria meningitidis glycosyl transferase
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A; Residues: 1-349 <TET>
A; Cross-references: GB: AE002541;
A; Experimental source: serogroup
C; Genetics:
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                                                                                                                               A; Molecule type: DNA
A; Residues: 1-346 <PAR>
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                                                        1gtA; NMA0524
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVID 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             RILAQPRNSGLIPSLNIGLDELAKSGGGGEYIARTDADDIAAPDWIEKIVGEMEKDRSII 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LQPLVSVLICAYNVEKYFAQSLAAVVNQTWRNLDILIVDDGSTDGTLAIAQRFQEQDGRI 76
                                         Neisseria
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                                     meningitidis glycosyl transferase
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                                                                                            GB:AL157959; NID:g7379120; PIDN:CAB83816.1; PID:g737926
A, strain Z2491
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Mungall, K.; Quail,
Length 346;
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M.A.;
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Dougherty, B.
Pizza, M.
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Rajandream,
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                                                                                                                                     LRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKEE
                                                                                                                                                                                                             AWLEVLSEENNKSYLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI-DGG
DLLDFLTDRVMRKLFAAPQYRKILKKMLR
                                                                                                                                                                                                                                                                                      ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG
                                                                                                                                                                                                                                                                                                                                                               PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI
                                                                                                               LIFNKDYPYAEDYKFWSEVSRLGCLANYPEALVKYRLHGNQTSSVYNHEQNETAKKIKRE
                                                                                                                                                                                          SYLEIIVEK-ECGIIGSQYKTGDIWKNPLLHNDICEAMLFYNPIHNNTMIMRANVYREHK
                                                                                                                                                                                                                                                                                                                                           PLVSVIVCAYNAEQYIDESISSIINQTYENLEIIVINDGSTDLTLSHLEEISKLDKRIKI
                                                                        IRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSLT
                                                                                                                                                                                                                                                                  ISNKYNLGFINSLNIGLGCFS----GKYFARMDADDIAKPSWIEKIVTYLEKNDHITAMG
                                                                                                                                                                                                                                                                                                                                                                                                                    151;
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MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDG
GAWLDFAADGKMRRLFTMRQYFGILHRLIK 330
                                               TDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                                                                                                                                                    EIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSL
                                                                                                                                                                                                                                 GLRFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKE
                                                                                                                                                                                                                                                                                                                                                                                                         KILAQAQNSGLIPSLNIGLDELAKSGMGEYIARTDADDIAAPDWIEKIVGEMEKDRSIIA
                                                                                                    TARNDFLQSMGFKTRFDSLEYRQIKAVAYELLEKHLPEEDFERARRFLYQCFKRTDTPPA
                                                                                                                                                                                                    GLRYNTERDWAEDYQFWYDVSKLGRLAYYPEALVKYRLHANQVSSKYSIRQHEIAQGIQK
                                                                                                                                                                                                                                                                                                         MGAWLEVLSEEKDGNRLARHHRHGKIWKKPTRHEDIADFFPFGNPIHNNTMIMRRSVIDG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOPLVSVLICAYNVEKYFAQSLATVVNQTWRNLEILIVDDGSTDGTLAIAKDFQKRDSRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                           RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   35;
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A;Molecule type: DNA A;Residues: 1-323 <TIGR> A;Residues: 1-323 <TIGR> A;Cross-references: GB:U32832; GB:L42023; NID:g1574421; PIDN:AAC23227.1; PID:g1574422 C;Superfamily: Neisseria meningitidis glycosyl transferase A A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae FA;Reference number: A64000; MUID:95350630; PMID:7542800 A;Accession: H64130 A; Status: nucleic acid sequence not shown; translation not 38.7%; Score 682.5; DB 1 Pred. No. 4.3e-49; 4; Mismatches 107 Length shown ; Kerlavage M.; Weidman Jen, N.S.M. Vente

54;

DB 1;

Indels

17;

Gaps

6

-INSVSLLEIYHVDKSNK---VLKSILYEMYMSLDKYTIT

301

239

290

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glycosyltransferase [imported] - Clostridium acetobutylicum C;Species: Clostridium acetobutylicum C;Species: Clostridium acetobutylicum C;Date: 14-Sep-2001 *sequence_revision 14-Sep-2001 *text_change 14-Sep-2001 C;Accession: B97168
R;Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.S.; Zeng, Q.; Gib
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B97168
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A;Experimental source: strain 1021, megaplasmid pSymB
A;Experimental source: strain 1021, megaplasmid pSymB
R;Gallbert, F.; Finan, T.M.; Long, S.R.; Puhler, A.; Abola, P.; Ampe, F.; Barl, pela, D.; Cchain, P.; Cowie, A.; Davis, R.W.; Dreano, S.; Federspiel, N.A.; Fisipela, D.; Komp, C.; Hyman, R.W.; Jones, T.
L.; Hyman, R.W.; Jones, T.
Science 293, 668-672, 2001
A;Authors: Kahn, D.; Kahn, M.L.; Kalman, S.; Keating, D.H.; Kiss, E.; Komp, C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       R;Finan, T.M.; Weidner, S.; Wong, K.; Buhrmester, J.; Chain, P.; Proc. Natl. Acad. Sci. U.S.A. 98, 9889-9894, 2001
A;Title: The complete sequence of the 1,683-kb pSymB megaplasmid A;Reference number: A95842; MUID:21396508; PMID:11481431
A;Accession: G95948
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                A;Authors: Kahn, D.; Kahn, M.L.; Kalman, S.; Keating, D.H.; Kiss, E.; Komp, hebault, P.; Vandenbol, M.; Vorholter, F.J.; Weldner, S.; Wells, D.H.; Wong, A;Tille: The composite genome of the legume symbiont Sinorhizobium meliloti. A;Reference number: A96039; MUID:21368234; PMID:11474104
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-367 < KUR>
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C;Accession: G95948
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C; Species: Sinorhizobium meliloti
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                                                                                                                                                                                                                                                                                                                                                                                                                                           KYNLQQRRTAWKIKEEIRA------GYWKAAGIAVGADCLNYGLLKSTAYALYEKALS 277
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIH----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ISNPRNIGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PVVSIVLPVYNAEPYIAAAIESVLRQDYERLEVIAIDDGSTDRSRDILERYRKSDSRVSI 63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
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                                                                                                                                                                                                                                                                MLRPW
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                                                                                                                                                                                                                                                                                                         AQPGEVRRAYEDGALCFFYFLYQLIAEEEQPRLTH--EFLTRTGKWGLIRRRERYGLLAA 328
                                                                                                                                                                                                                                                                                                                                                       GQ-----DIG--CLRLFLYEYFLSLEKYSLTDLLDFLTDRVMRKLFAAPQYRKILKK 327
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ISR-ENRGLIATLNEGL-ALAK----GELIARMDADDIAYPSRLSRQVALFSAEPRLALSG 118
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Pred. No. 4.9e-21
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    Zeng, Q.; Gibson,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              E.; Komp, C.; Lelaure, D.H.; Wong, K.; Yeh, K
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R; Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.S.; Daly, M.J.; Bennett, G.N.; Koonin, E.V.; Smith, D.R. J. Bacteriol. 183, 4823-4838, 2001
A;Title: Genome Sequence and Comparative Analysis of the Solve A; Reference number: A96900; MUID:21359325; PMID:21359325
A; Accession: A97168
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        glycosyltransferase [imported] - Clostridium acetobutylicum
C;Specias: Clostridium acetobutylicum
C;Specias: Clostridium acetobutylicum
C;Date: 14-Sep-2001 #sequence_revision 14-Sep-2001 #text_change 14-Sep-2001
C;Accession: A97168
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A;Title: Genome Sequence and Comparative Analysis of the A;Reference number: A96900; MUID:21359325; PMID:21359325
A;Status: preliminary
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                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: GB:AE001437; PIDN:AAK80132.1; PID:g15025168; GSPDB:GN00168 A;Experimental source: Clostridium acetobutylicum ATCC824
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A; Residues: 1-336 < KUR>
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A; Residues: 1-333 < KUR>
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AWLEVLS--EENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPI-HNNTMIMRRSVID 179
                                                                                                                                                                        PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
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                                                                           ISNPRNIGFIASINIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMG 122
                                                                                                                                             PKVSIVMPVYNSERYLAEAIESILDQTYNDFEFIIVDDGSTDESYNIISSYANKDNRIIV 64
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                                             ISR-EHRGLVDSLNEGIN-IAR---GKYIARMDADDISINNRIEKQFEFLELNKDVDILG 119
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Pred. No. 8.1e-
                                                                                                                                                                                                                                          Score 263.5; DB 2
Pred. No. 3.1e-14;
1; Mismatches 123
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ATCC824
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-NSAFSIK-FDSQNIEQVFLTSCAIPHPSVMFKKDSIVK 173

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glycosyltransferase [imported] - Clostridium acetobutylicum c;Species: Clostridium acetobutylicum C;Species: Clostridium acetobutylicum C;Date: 14-Sep-2001 #sequence_revision 14-Sep-2001 #text_change 14-Sep-2001 C;Accession: H97167 R;Nolling, J.; Breton, G.; Omelchenko, M.V.; Markarova, K.S.; Zeng, Q.; Gib: paly, M.J.; Bennett, G.N.; Koonin, E.V.; Smith, D.R. J. Daly, M.J.; Bennett, G.N.; Koonin, E.V.; Smith, D.R. J. Bacteriol. 183, 4823-4838, 2001 J. Bacteriol. 183, 4823-4838, 2001 A;Fitle: Genome Sequence and Comparative Analysis of the Solvent-Producing 1 A;Reference number: A96900; MUID:21359325; PMID:21359325
A;Cross-references: GB:AE001437; PIDN:AAK80131.1; PID:915025167; GSPDB:GN00168 A;Experimental source: Clostridium acetobutylicum ATCC824 C;Genetics:
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C; Superfamily:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             R;Yamasaki, S.; Shimizu, T.; Hoshino, K.; Ho, S.T.; Shimada, T.; Nair, G.B.; Takeda, Y. Gene 237, 321-332, 1999
A;Title: The genes responsible for O-antigen synthesis of Vibrio cholerae O139 are close A;Reference number: Z22749; MUID:99453293; PMID:10521656
A;Accession: T44330
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C;Species: Vibrio cholerae
C;Date: 21-Jan-2000 #sequence_revision 21-Jan-2000 #text_change 21-Jul-2000
C;Accession: T44330
                                                                  A; Molecule type: DNA
A; Residues: 1-333 < KUR>
                                                                                                                A;Reference number: A96900;
A;Accession: H97167
A;Status: preliminary
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A; Residues: 1-340 < YAM>
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A; Residues: 1-271 <STO>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         R;Takami, H.; Nakasone, K.; Takaki, Y.; Maeno, Nucleic Acids Res. 28, 4317-4331, 2000
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT 10
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local
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                                                                                                                                        178
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                                                                                                                                                                                                                                121 MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVF---PFGNPIHNNTMIMRRSV 177
                                                                                                                                                                                                                                                                                                                           61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             64
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nes 95; Conserv
                                                                                                                                                                                                                                                                                61
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                                                                                                                                                                                                                                                                                                                                                                                                                     ш
                                                                                                                                                                                                                                                                                                                                                                                                  MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  DGIKIKLIDVFKREFKKDFKYIVWGASNGGKITKEVLDEFFEKSQCIAFVDKFKTGEFEK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           R-ENKGIVYSLNEAI-RLAK---GEYIARMDADDISAPKRIEKQISFLKSHRDIDILGTQ 118
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   NPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMGAW 124
  KMGFAGARRVKAKPIAYIGITV
                                             RTAWKIKEEIRAGYWKAAGIAV
                                                                                                                                                                                                                                                                                RLIHNKNNRGLSYSLAEGV-SLAKA---PWIARMDADDVSFKDRLAVQMDHVKAHSELDI 116
                                                                                                                                                                                                                                                                                                                           RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                                                                                                                                                                                                                                                                                                        MNPEVTVLMSVYNDKNYLSESIESILNQTFENFEFLIINDASTDGSGELLEEYSKKDKRI 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IRILHPKDINHIK-FDYVFIATEPGKEEAMSSLKSMGLKCIKDFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ---LRELKGYNDFKSEDLDLWLRAIESGFKIYKLKEELIYFRMHEESKTRVDNQNYEGLK 226
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DGGLRFDPAY--IHAEDYKFWYEAGKLGRLAY-YPEALVKYRFHQDQTS--SKYNLQQRR 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VKVVGNISNDIKEKNENKLNI---EFDIYD-DNREKILNYWYCLAHP----SVMFRKDI- 169
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LEVLS-----EENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVI 178
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VSVVMPVYNSEKYLKESIESILNQSYSDLEFIIINDGSTDNSFKIIKEYAKLDKRINVIS
                                                                                          IKAG-SYDRNLRRRQDYDLWFRCLEAKL-KFENIDKPLLYYRSTDDYYKKNNFKVQVQQA
                                                                                                                                     IDGGLRFDPAYIHAEDYKFWYEA--GKLGRLAYYPEALVKYRFHQD----QTSSKYNLQQR 232
                                                                                                                                                                                     LGSYVIDIDDKGNELEIRKV-----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       -DIGCLRLFLY------EYFLSLEKYSLTDLLDFLT 308
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
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27.5%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                     58;
                                               254
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  244
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 249; DB 2;
Pred. No. 3.8e-13;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Score 258; DB 2;
Pred. No. 8.9e-14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mismatches
                                                                                                                                                                                     -PTTHKEIANLIWTCPF---IHPTVLFKKDSI 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 G.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     108;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Sasaki,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Length 271;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                   26;
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RESULT 12
AI2091
                                                                                 A;Cross-references: GB:BA000019; PIDN:BAB73987.1; PID:g17131380; GSPDB:GN00179
A;Experimental source: strain PCC 7120
C;Genetics:
A;Gene: a112288
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         glycosyl transferase (EC 2.4.-.) - Methanococcus jannaschii
C;Speciles: Methanococcus jannaschii
C;Speciles: Methanococcus jannaschii
C;Date: 13:Sep-1996 #sequence_revision 13:Sep-1996 #text_change 10-Oct-1997
C;Accession: H64431
R;Bult, C.J; White, O.; Olsen, G.J.; Zhou, L.; Fleischmann, R.D.; Sutton, G.G.; Blake, Relich, C.I.; Overbeek, R.; Kirkness, E.F.; Weinstock, K.G.; Merrick, J.M.; Glodek, A.; Reich, C.I.; Sadow, P.W.; Hanna, M.C.; Cotton, M.D.; Roberts, K.M.; Hurst, M.A.
Science 273, 1058-1073, 1996
A;Authors: Kaine, B.P.; Borodovsky, M.; Klenk, H.P.; Fraser, C.M.; Smith, H.O.; Woese, GA;Title: Complete genome sequence of the methanogenic archaeon, Methanococcus jannaschia, Reference number: A64300; MUID:96337999; PMID:8688087
A;Accession: H64431
A;Accession: H64431
                                                                                                                                                                                                                           Nakazaki, N.; Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada, M.; Yasuda, M.; Tabata, SDNA Res. 8, 205-213, 2001
A;Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium Analymeterence number: AB1807; MUID:21595285; PMID:11759840
A;Accession: AIZ091
                                                                                                                                                                                                                                                                                        C;Accession: AI2091
C;Accession: AI2091
R;Kaneko, T.; Nakamura, Y.; Wolk, C.P.; Kuritz, T.; Sasamoto,
Nakazaki, N.; Shimpo, S.; Sugimoto, M.; Takazawa, M.; Yamada,
                                                                                                                                                                                                                                                                                                                                                                      glucosyltransferase [imported] - Nostoc sp. (strain PCC 7120)
C;Species: Nostoc sp.
A;Note: Nostoc sp. strain PCC 7120 is a synonym of Anabaena sp. strain PCC 7120
C;Date: 14-Dec-2001 #sequence_revision 14-Dec-2001 #text_change 30-Jun-2002
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                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-343 <KUR>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A;Map position: FOR996513-997385
C;Keywords: glycosyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Cross-references: GB:U67549; GB:L77117; NID:g1591709; PID:g1592318; TIGR:MJ1057; PID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A; Molecule type: DNA
A; Residues: 1-290 <BUL>
                                                                                                                                                                                                          A;Status: preliminary
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A: Status: preliminary; nucleic acid sequence not shown; translation not shown
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    Matches
                         Best Local
                                             Query Match
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             LLFSWVYFIDENGN--ILKEF------KPEKYKFKEIKKYF-FKEHLTVHPSMMVKSK 171
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AMGAWLEVLSEENNKSVLAAIARNGAIWDKPTRH--EDIVAVFPFGNPIHNNTMIMRRSV 177
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         IRIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSII 119
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      QPLVSVLICAYN-AEKYFAQSLAAVVGQTWRNLDILI-VDDGSTDGTPAIARHFQEQDGR 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KPLVSVVMATYNEPEKYLKESIESIXNQTXKDFXFIIXLDNPNNKKAEEIIKEYQQKDKR 66
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IDGGLREDPAYIHAEDYKEWYEA-GKLGRLAYYPEALVKYRF-HQDQTSSK-----YNL 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ILKKLKYDEKLIRSQDYDFWIRCIANDYKFDIIEEFLLKYRIPNRDNYLSRIKKQKLYSY 231
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               IIFIKNERNLGRGASRN----KAVXIARGKYIAILDADDIALPKRLEKQFKYMENNRDID 122
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   79;
  . Similarity 78; Conserv
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    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conservative
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                       13.9%;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                252
    50;
Score 244.5; DB Pred. No. 1.2e-150; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Score 248.5; DB 2; Pred. No. 4.5e-13;
                                        DB 2;
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    Indels
                                        Length
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                                           343;
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  53;
                                                                                                                                                                                                                                                                                                             Watanabe, A.; Yasuda, M.;
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RESULT 13
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A;Gene: PAB0772
C;Superfamily: Neisseria meningitidis glycosyl transferase
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A;Molecule type: DNA
A;Molecule type: CNA
A;Residues: 1-298 <AKW>
A;Cross-references: GB:AJ248286; GB:AL096836; NID:g5458366; PIDN:CAB50071.1;
A;Experimental source: strain Orsay
A;Status: preliminary
A;Molecule type: DNA
A;Status: preliminary
A;Molecule type: DNA
A;Status: preliminary
A;Molecule type: DNA
A;Molecule type: DNA
A;Status: preliminary
A;Molecule type: DNA
A;M
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A; Accession: B75096
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A;Description: Pyrococcus abyssi genome sequence: insights into archaeal chromosome
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C;Species: Pyrococcus abyssi
C;Date: 20-Aug-1999 #sequence_revision 20-Aug-1999
C;Accession: B75096
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                                                                                                                                                                        LIRK-----HLDIWKNPKI-LSIHLSQMGLLLLLSNNTGKGLKYLTYSIAIAP---
                                                                                                                                                                                                                                                      TAWKIKEEIRAGYWKAAGIAVGADCLNYGLL-----KSTAYALYEKALSGQDIGCLR 285
                                                                                                                                                                                                                                                                                                                                                 CFKKAGLFDPRLSSSQDWDMWLRIARYYKFDYVDEIIAKYYVHGKQISFNMKKYIPGRER
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Pred. No. 1.3e-12;
8; Mismatches 128
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R;Kinst, F.; Ogasawara, N.; Moszer, I.; Albertini, A.M.; Alloni, G.; Azevedo, V.; Berter C.; Bron, S.; Brouillet, S.; Bruschi, C.V.; Caldwell, B.; Capuano, V.; Carter, N.M.; Chd A; Ehrlich, S.D.; Emmerson, P.T.; Entian, K.D.; Errington, J.; Fabret, C.; Ferrari, E. Nature 390, 249-256, 1997

Nature 390, 249-256, 1997

Nature 390, 249-256, 1997

Nature 390, 249-256, 1997

Nature 390, 249-256, 1997

Nature 390, 249-256, 1997

Nature 390, 249-256, 1997

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Nature 390, 249-256

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A;Title: Complete Genomic Sequence of the Filamentous Nitrogen-fixing Cyanobacterium An: A;Reference number: AB1807; MUID:21595285; PMID:11759840
A;Accession: AG1920
A;Status: preliminary
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A;Residues: 1-337 <KUR>
A;Cross-references: GB:BA000019; PIDN:BAB72871.1; PID:g17130260; GSPDB:GN00179
A;Experimental source: strain PCC 7120
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A;Reference number: A69580; MUID:98044033; PMID:9384377
A;Accession: D70036
A;Status: preliminary; nucleic acid sequence not shown; translation not shown A;Molecule type: DNA
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236 --KLPLSDYI-YIAKPLIRAFMPAAVMNRYHKK 265
                                                                               203 LYKVREDSDA--FKRRSFTYSID-
                                                                                                                                                                                                      180 --GGLRFDPAYIHAEDYKFW---YEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRT 234
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                                      LEKYSLTDLLDFLTDRVMRKLFAAPQYRKILKK 327
                                                                                                                                                                                                                                                 GTGMLVFDEFGVRGARILPSVPEPG-----IMAKGTPFCHGTIMMRASAYR 166
                                                                                                                    AWKIKEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLS 294
                                                                                                                                                                                                                                                                                                                                 LIQNKTNKRLAASLNHCLSHAT----GDYIERQDGDDLSFPRRLEKQVAFLEKHRHYQVV 120
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Search completed: December 2, 2002, 12:00:10 Job time: 15.9563 secs

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DPM1_RAIME
YAGC_BACSU
YTH1_RHOER
YGCC_BACSU
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                                                                                                                                                                                                                                                                                                                                                                                                                                          Q57287 haemophilus
Q58457 methanococc
Q57022 haemophilus
P22639 anabaena sp
Q46635 erwinia amy
   046635
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P11290
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RA Bult C.J., White O., Olsen G.J., Zhou L., Fleischmann R.D., Reich C.I., Ra Sutton G.G., Blake J.A., FitzGerald L.M., Clayton R.A., Gocayne J.D., Ra Kerlavage A.R., Dougherty B.A., Tomb J.-F., Adams M.D., Reich C.I., Ra Overbeek R., Kirkness E.F., Weinstock K.G., Merrick J.M., Glodek A., Scott J.L., Geoghagen N.S.M., Reidman J.F., Fuhrmann J.L., Nguyen D., RA Scott J.L., Geoghagen N.S.M., Peterson J.D., Sadow P.W., Hanna M.C., Ra Utterback T.R., Kelley J.M., Peterson J.D., Sadow P.W., Hanna M.C., Ra Cotton M.D., Roberts K.M., Hurst M.A., Kaine B.P., Borodovsky M., RA Klenk H.-P., Fraser C.M., Smith H.O., Woese C.R., Venter J.C.;
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                                                                                                                                     InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Complete proteome.
SEQUENCE 290 AA; 35099 MW; 3F6AlB221C420D74 CRC64;
                                                                                                                                                                                                                                                                         the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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Archaea; Euryarchaeota; Methanococci; Methanococcales;
Methanocaldococcaceae; Methanocaldococcus.
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30-MAY 2000 (Rel. 39, Last sequence update)
16-CCT-2001 (Rel. 40, Last annotation update).
Putative glycosyl transferase MJ1057 (EC 2.-..
                                                                                                                                                                                                                                                                                                                                                                                                                          Science 273:1058-1073(1996).
-!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
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KPLVSVVMATYNEPEKYLKESIESIXNQTXKDFXFIIVLDNPNNKKAEEIIKEYQQKDKR
                           QPLVSVLICAYN-AEKYFAQSLAAVVGQTWRNLD-ILIVDDGSTDGTPAIARHFQEQDGR 59
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15-JUL-1998 (Rel. :
15-JUL-1998 (Rel. :
15-JUN-2002 (Rel. :
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HSSP; P39621;
TIGR; HI0868;
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STRAIN=Rd / KW20 / ATCC 51907;
MEDLINE=95350630; PubMed=7542800;
                                                                                                                                                                                    Hypothetical protein; Transferase; Glycosyltransferase; Complete proteome.
SEQUENCE 250 AA; 28915 MW; A5DR3201120787800 CDC4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
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                                                                66;
                                                                                             Score 209; DB 1;
Pred. No. 3.6e-10;
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                                                                   105;
                                                                                                                       Length 250;
                                                                   Indels
                                                                64;
                                                             Gaps
      62
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RESULT 4
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Query Match
Best Local Similarity
                                              SEQUENCE
                                                                       EMBL; AF031959; AAC32401.1; ALT_INIT.
PIR; B35391; B35391.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
                                                                                                                                                                                     modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                               This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=21595285; PubMed=11759840;
Kaneko T., Nakamura Y., Wolk C.P., Kuritz T., Sasi
Watanabe A., Iriguchi M., Ishkawa A., Kawashima I
Kishida Y., Kohara M., Matsumoto M., Matsuno A., I
Nakazaki N., Shimpo S., Sugimoto M., Takazawa M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      15-JUN-2002 (Rel. 41, Last annotation update)
Putative glycosyl transferase alr2836 (EC 2.-.-).
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                                                                                                                                      EMBL; AF031959; AAC32401.1;
                                                                                                                                                                                                                                                the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    cyanobacterium Anabaena sp. strain
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Bacteria; Cyanobacteria; Nostocales; Nostocaceae; Nostoc
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15-JUN-2002 (Rel.
15-JUN-2002 (Rel.
                                                                                                                                                                                                                                                                                                                            "Identification and characterization of hetA, a gene that acts in the process of morphological differentiation of heterocysts J. Bacteriol. 172:3131-3137(1990).
                                                                                                                                                                                                                                                                                                                                                                          MEDLINE=90264305; PubMed=2111805; Holland D., Wolk C.P.;
                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE OF 1-131 FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                    "Complete genomic sequence of the filamentous nitrogen-fixing cyanobacterium Anabaena sp. strain PCC 7120.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Nakazaki N., Shimpo
Yasuda M., Tabata S.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=103690;
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                                                                                                                                                                                                                                                                                                      Bacteriol. 172:3131-3137(1990).
- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
                                                                                                                                                                                                                                                             SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RAGYWKAAGIAVGADCLNYGLLKST--AYALYEKALSGQDIGCLR-----LFLYEYFLS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           RFDPAYIHAEDYKFWYEAGKLGRLAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKEEI 242
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               FFTPTNQGPAAARNIGLEK----AQGDYITFLDSDDFIANDKLEKQLNFMLQNHLVMTHG
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                                                           proteome.
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                                              36388 MW;
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Score 195.5; DB 1 Pred. No. 6.5e-09;
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                                             753C2FB59327D968 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        update)
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              DB 1;
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                Length 322;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Yamada M.,
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Matches Query Match Best Local

Similarity

11.0%; 27.0%;

Conservative

44;

Mismatches

128;

44;

Gaps

14;

60

Length 266; Indels

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AMSE_ERWAM
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Q46635;
01-NOV-1997
                                                   InterPro; IPR001173; Glycos_transf_2.

Pfam; PF00535; Glycos_transf_2; 1.

Exopollysaccharide synthesis; Transferase; Glycosyltransferase.

SEQUENCE 266 AA; 30748 MW; 163268A4210EB47B CRC64;
                                                                                                                                               or send an email to license@isb-sib.ch).
                                                                                                                                                                            use by non-profit institutions as long as modified and this statement is not removed. U
                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its
                                                                                                                                                                                                                                                                                         MO1. Microbiol. 15:91/-933(1277).
-i- FUNCTION: INVOLVED IN THE BIOSYNTHESIS OF FUNCTIONS AS A VIRULENCE FACTOR.
                                                                                                                                                                                                                                                                                                                                 Bugert P., Gedder K.,
"Molecular analysis of the ams operon required synthesis of Erwinia amylovora.",
Mol. Microbiol. 15:917-933(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       01-NOV-1997 (Rel. 35, Cr
01-NOV-1997 (Rel. 35, La
15-JUN-2002 (Rel. 41, La
Amylovoran biosynthesis
                                                                                                                   EMBL; X77921; CAA54886.1;
                                                                                                                                                             modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A. STRAIN=EA1/79;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Erwinia amylovora
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                                                                                                                                                                                                                                                                      -!- PATHWAY: Exopolysaccharide biosynthesis.
                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=95319333; PubMed=7596293;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             NCBI_TaxID=552;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SATSEQEAKSQAGIEMTNQYINDFLVRIGYGARVDLSRNLQYRRTKYYQRSQWDLRE---
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35, Last sequence update)
41, Last annotation updat
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Score 194; Ub .,
No. 6.7e-09;
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                                                                                                                                                                                                                                                                                                                   AMYLOVORAN WHICH
                                                                                                                                                                                                                                                                                                                                                                  for exopolysaccharide
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EC
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RESULT 6
AMSB_ERWAM
ID AMSB_E AC Q46632
DT 01-NOV
DT 01-NOV
DT 01-NOV
DT 01-NOV
DT 01-NOV
DT 01-NOV
CG Erwini
OC Erwini
OC ETRAIN
RX MEDLIN
RR MEDLIN
RR MEDLIN
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01-NOV-1997
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Exopolysacchari
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Bugert P., Geider K.;
"Molecular analysis of the ams operon required
synthesis of Erwinia amylovora.";
Mol. Microbiol. 15:917-933(1995).
                                                                                                                                                                                                                                                                                     EMBL; X77921; CAA54883.1; -
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SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
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                                                                                                                                                                                                                                                                                                                                                                      SWISS-PROT entry is copyright. It is produced through a collab
een the Swiss Institute of Bioinformatics and the EMBL outst
European Bioinformatics Institute. There are no restrictions
by non-profit institutions as long as its content is in
                                                                                        SVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRIISN 65
ERYSGL--KINLVLSETKLNGAGARNRGIDLATGDYVCFLDADD----EWHKDKLQQNLS
                                   PRNLGFIASLNIGLDELAKSGG-----
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                                                                    SVVIPAYNASESIITTLDCLNEQSYKNFDVIIVDDKSAD
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PF00535; Glycos_transf_2; 1.

PF00535; Glycos_transf_2; Transferase;

PF00535; Transferase;
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P11290; P22999;
01-JUL-1989 (Rel.
01-OCT-1994 (Rel.
                                                                                                        EMBL; U00039; AAB18592.1; -.
EMBL; ACCOU439; AAC76639.1; -.
EMBL; X06690; CAAC29885.1; -.
PIR; A30268; Q3ECTH.
PIR; B33276; B33276.
ECOGene; EG11266; yibb.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
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STRAIN-K12 / Mc1655;
MEDLINE=94316500; PubMed=8041620;
MEDLINE=94316500; PubMed=8041620;
Sofia H.J., Burland V., Daniels D.L., Plur
"Analysis of the Escherichia coli genome.
"Analysis of the St. minutes.";
region from 76.0 to 81.5 minutes.";
                                         SEQUENCE
                                                      CONFLICT
                                                                                                                                                                                                                                                    or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                use by non-profit institutions as long modified and this statement is not removed.
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                                                                                                                                                                                                                                                                                                                                                                                J. Biol
                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE=89174812; PubMed=2647748;
Aronson B.D., Somerville R.L., Epperly B.R., Dekker E.;
"The primary structure of Escherichia coli L-threonine
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                                                                                  CONFLICT
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-!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 2.
                                                                                                                                                                                                                                                                                                                                                                                           dehydrogenase."
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Score 178.5; DB 1
Pred. No. 1.8e-07;
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A Azevedo V. Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
Bouriss R., Boursier L., Brans A., Baraun M., Brignell S.C., Bron S.,
Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.,
A Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M.,
A Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
A Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
A Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T.,
A Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T.,
A Denizot F., Devine K.M., Fabret C., Ferrari E., Foulger D.,
A Fritz C., Fujita M., Fujita Y., Fuma S., Gallzzi A., Galleron N.,
A Fritz C., Fujita M., Fujita Y., Fuma S., Gallzzi A., Galleron N.,
A Fritz C., Fujita M., Fujita Y., Fuma S., Gallzzi A., Galleron N.,
A Guiseppi G., Guy B.J., Haga K., Haich J., Harwood C.R., Henaut A.,
A Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
A Kobayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M.,
A Kurita K., Lardinois S., Lauber J., Lazarevic V.,
A Kurita K., Lardinois S., Lauber J., Lazarevic V.,
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01-NOV-1995
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                      Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
Lee S. M., Levine A., Liu H., Masuda S., Mauel C., Medigue C.,
Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,
Noone D., O'Reilly M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M.,
Prescoan E., Pujic P., Purnelle B., Rapport G., Rey M., Reynolds S.
Rieger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,
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  Rocha E., Roche B., Rose M., chleich S., Schroeter R., Sco
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OS OS

Rhizobium

meliloti (Sinorhizobium meliloti)

EXOA_RHIME STANDARD; PRT; 330 AA. p33691; 01-FEB-1994 (Rel. 28, Created) 01-FEB-1994 (Rel. 28, Last sequence update) 15-JUN-2002 (Rel. 41, Last annotation update) Succincellycan biosynthesis protein exoA (EC 2 EXOA OR RB1082 OR SMB20957.

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Interpro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Transferase; Glycosyltransferase; Complete proteome.
SEQUENCE 446 AA; 53148 MW; BB3698D9B6856C42 CRC64;
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EMBL; Z22636; CAA80345.1; -.
EMBL; AL603645; CAC49482.1; -.
PIR; S37027; S37027.
PIR; S39956; S39956.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Transferase; Glycos_transf_2; Exopolysaccharide synthesis;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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"The commission of the commission 
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MEDINE-94067019; PubMed-8246891;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
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Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
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Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
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Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.;
Becker A., Kleickmann A., Keller M., Arnold W., Puehler M., Puehler M., Arnold W., Arnold W., Puehler M., Arnold W., Arnold W., Puehler M., Arnold W., A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TRANSMEM
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IRIDAHGTYPDDYCERLV-----EDALATGADSVVVAMQTVGFSTFQKATAFAQNSKLG 149
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sen the Swiss Institute of Bioinformatics and the EMBI
                                                                 ARTDADDIASPGWIEKIVGEMEKDRSIIAMGAWLEVLSEE----NNKSVLAAIARNGAIW 147
                                                                                                                                          NARVVIADGGSTDGTREIARRLATEDPRVLFLDNPKRIQ-SAAVNRAVAEL--GAGSDYL
                                                                                                                                                                                                            NLDILIVDDGSTDGTPAIARHFQEQDGRIRIISNPRNLGFIASLNIGLDELAKSGGGEYI 91
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pSymB (megaplasmid 2).
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Pred. No. 2.4e
39; Mismatches
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                                                                                                                                                                                               Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
Lee S.M., Levine A., Liu H., Masuda S., Mauel C., Medique C.,
Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,
Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,
Noone D., O'Reilly M., Ogawa K., Ogiwara A., Oudega B., Park S.H.,
Parro V., Pohl T.M., Portetelle D., Porwollik S., Prescott A.M.,
Presecan E., Pujic P., Purnelle B., Rapoport G., Rey M., Reynolds S.
Rieger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,
Sato T., Scanlan E., Schleich S., Schroeter R., Scoffone F.,
Sekiguchi J., Sekowska A., Seror S.J., Serror R., Scoffone F.,
Sekiguchi J., Tacconi E., Takagi T., Takahashi H., Takemaru K.,
Takeuchi M., Tamakoshi A., Tanaka T., Terpstra P., Tognoni A.,
Tosato V., Uchiyama S., Vandenbol M., Vannier F., Vassarotti A.,
Vannier B., Vandenbol M., Vannier F., Vassarotti A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Kunst F., Ogasawara N., Moszer I., Albertini A.M., Alloni G., Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S., Boursier L., Brans A., Braun M., Brignell S.C., Bron S., Brouillet S., Bruschi C.V., Caldwell B., Capuano V., Carter N.M., Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A., Denizot F., Devine K.M., Dusterhoft A., Ehrlich S.D., Emmerson P.T., Entian K.D., Errington J., Fabret C., Ferrari E., Foulger D., Fritz C., Fujita M., Fujita Y., Fuma S., Galizzi A., Galleron N., Ghim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G., Guy B.J., Haga K., Haiech J., Harwood C.R., Henaut A., Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L., Joris B., Karamata D., Kasahara Y., Klaerr-Blanchard M., Klein C., Kobayashi Y., Koetter P., Koningstein G., Krogh S., Kumano M., Kurita K., Lapidhs A., Lardinois S., Lauber T., Lapackey V.
                                                                                                                               Winters P., Wipat A., Yamama
Yoshida K., Yoshikawa H.F.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Glaser P., Kunst F., Arnaud M., Coudart M.P., Gonzales W., Hullo M.F., Ionescu M., Lubochinsky B., Marcelino L., Moszer I., Presecan E., Santana M., Schneider E., Schweizer J., Vertes A., "Rapoport G., Danchin A.; "Bacillus subtilis genome project: cloning and sequencing of the kb region from 325 degrees to 333 degrees."; Mol. Microbiol. 10:371-384(1993).
X-RAY CRYSTALLOGRAPHY (1.5 ANGSTROMS).
                                                                                    "The complete subtilis.";
                                                                                                                                                                            Viari A., Wambutt R.,
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15-JUN-2002 (Rel. 41, Last annotation update)
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                                                     390:249-256(1997).
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                                                                                                  sequence
                                                                                                                          Wedler E., Wedler H., Weitzenegger T
Yamamoto H., Yamane K., Yasumoto K.,
H.F., Zumstein E., Yoshikawa H., Dan
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Created)
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                                                                                               Zumstein E., Yoshikawa H., Danchin A.; se of the Gram-positive bacterium Bacillus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            256
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                                                                                                                                                                                                                                                                    RESULT 11
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                                                                                                                                             P33697;
01-FEB-1994 (Rel. 28, Created)
15-JUN-2002 (Rel. 41, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
                                                                                                                                  Succinoglycan biosynthesis protein EXOO OR RB1084 OR SMB20959.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PDB; 1QG8; 21-APR-00.
PDB; 1QG0; 04-MAX-00.
PDB; 1QG5; 04-MAY-00.
Subtilist; B610609; spsA.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EWBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
STRAIN=1021;
MEDLINE=94042869;
                                                                                      Plasmid pSymB (megaplasmid 2).
Bacteria; Proteobacteria; alpha subdivision;
                                                                                                                      Rhizobium meliloti (Sinorhizobium meliloti).
                                                                                                                                                                                                                                   EXOO_RHIME
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; X73124; CAA51619.1; -. EMBL; Z99123; CAB15817.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Biochemistry 38:6380-6385(1999).
-I- FUNCTION: GLYCOSYLTRANSFERASE IMPLICATED IN THE SYNTHESIS OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Charnock S.J., Davies G.J.;
"Structure of the nucleotide-diphospho-sugar transferase, Sp. Bacillus subtilis, in mative and nucleotide-complexed forms."
                              SEQUENCE FROM N.A.
                                                            NCBI_TaxID=382;
                                                                            Rhizobiaceae;
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                                                                                                                                                                                                                                                                                                                                                                                                                                          117
                                                                                                                                                                                                                                                                                                                220 SIHFQLFELEKNEFVRNLPPQRNCRELRESLK 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         114
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                                                                                                                                                                                                                                                                                                                                                                                                                                        HPEKAVIYSASKTYHLNE--NRDIVKETVRPAAQVTWNAPC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIR- 61
                                                                                                                                                                                                                                                                                                                                           ALVKYRFHODOTSSKYNLOORRTAWKIKEEIR
                                                                                                                                                                                                                                                                                                                                                                          VMHRYSVLEKVKEKFGSYWDESPAFYRIGDARFFWRVNHF--YPFYPLDEELDLNYITDQ
                                                                                                                                                                                                                                                                                                                                                                                                        MIMRRSVIDG-----GLRFD--PAYIHAEDYKFWYEAGKLGRLAYYP-----E
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -KDRSIIAMGAWLEVLSEENNKSVLAAIARNGA--IWDKPTRHEDIVAVFPFGNPIHNNT 170
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    YQSDISGVKERTEKTRYAALINQAI-EMAE---GEYITYATDDNIYMPDRLLKMVRELDT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PKVSVIMTSYNKSDYVAKSISSILSQTFSDFELFIMDDNSNEETLNVIRPFL-NDNRVRF 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -----IISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEME- 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Similarity
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                                                                          Sinorhizobium
                                                                                                                                                                                                                                   STANDARD;
 PubMed=8226645;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      9.1%;
22.1%;
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TO THE GLYCOSYLTRANSFERASE FAMILY 2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              61;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 160.5;
Pred. No. 3.
                                                                                                                                                                                                                                   PRT;
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                                                                                                                                                                                                                                   348
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                                                                                         Rhizobiaceae
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Best Local :
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EMBL; L22636; CAA80347.1; -.
EMBL; AL603645; CAC49484.1; -.
PIR; C49348; C49348.
PIR; S37029; S37029.
PIR; S39958; S39958.
InterPro, IPRO01173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2: 1.
Transferase; Glycosyltransferase; Exopo
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J. Bacteriol.
[2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Becker A., Kleickmann A., Keller M., Arnold W., Puehler A.; Identification and analysis of the Rhizobium mellioti exoAMONP genes involved in exopolysaccharide biosynthesis and mapping of promoters located on the exoHKLAMONP fragment.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Glucksmann M.A., Reuber T.L., Walker G.C.; "Family of glycosyl transferases needed fo
                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Golding B., Puehler A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             MEDLINE=21396508; PubMed=11481431; Finan T.M., Weidner S., Wong K., B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=RCR2011 / SU47;
MEDLINE=94067019; PubMed=8246891;
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                                                                                                                                                                                                                                                                                                                                          Plasmid; Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              the European Bioinformatics Institute.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Proc.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        "The complete sequence of the 1,683-kb pSymB megaplasmid fixing endosymbiont Sinorhizobium meliloti.":
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Vorhoelter F.J., Hernandez-Lucas I.,
                                                                                                                                                                                                                                                                                                                                DOMAIN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 fixing
                              170
                                                             124
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FUNCTION: GLYCOSYLTRANSFERASE REQUIRED FOR THE SYNTHESIS OF SUCCINOGLYCAN (EPS I). NEEDED FOR THE ADDITION OF THE FIFTH (GLUCOSE), CATALYZES THE FORMATION OF A BETA-1,6 LINKAGE BET THE FOURTH AND FIFTH SUGAR.

PATHWAY: Exopolysaccharide biosynthesis.
SUBCELLULAR LOCATION: Cytoplasmic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAUTION: Ref.1 sequence differs from that frameshift in position 208.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY
                           TMIMRRSVIDGGLRFDPAYIHAEDYKFWYEAGKL-GRLAYYPEALVKYRFHQDQTS 224
                                                           NLDVVSLDGRSLRMFSEAELARLPQLTLPAFIESNVLF--RSEHN-----FGYMKPIFE-
                                                                                                                                                                                                                  PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gen. Genet. 241:367-379(1993).
                                                                                                                      IALDRNRGPGGARNAGIG----AARGRWIAVLDSDDTVRPDRLRRMIERADAAGAQIAVD
                                                                                                                                                                                   PDVTFVVAAYNSADTIVRAIESALAQEGVTVEVVVVDDCSADATPALVAAI--PDPRVRL
                                                                                                                                                     ISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAM- 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Natl. Acad.
                                                                                                                                                                                                                                                   60;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  endosymbiont Sinorhizobium meliloti.";
Natl. Acad. Sci. U.S.A. 98:9889-9894(2001)
                                                                                                                                                                                                                                              Similarity 25.4
60; Conservative
RRFLENQQLRFDEALRIGEDYILLASALACGGRCAVEPSAGYIYHIREGSIS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                non-profit institutions as long
                                                                                                                                                                                                                                                                                                              348 AA;
                                                                                          -GAWLEVLSEEN----NKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNN
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   by Rhizobium meliloti.";
175:7033-7044(1993).
                                                                                                                                                                                                                                                                                                              38131 MW;
                                                                                                                                                                                                                                                               8.8%;
                                                                                                                                                                                                                                                 40;
                                                                                                                                                                                                                                                                                                          POLY-VAL.
; 770B43782F785579
                                                                                                                                                                                                                                                               Pred.
                                                                                                                                                                                                                                                                 Score 155;
Pred. No.
                                                                                                                                                                                                                                               Mismatches
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                                                                                                                                                                                                                                                 104;
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                                                                                                                                                                                                                                                                                                              CRC64;
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Cowie
                                                                                                                                                                                                                                                                            Length 348;
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RESULT 12
YCDQ_ECOLI
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Best Local S
Matches 54
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01-NOV-1997
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                       "A 718-kb DNA sequence of the Escherichia coli K-12 ger corresponding to the 12.7-28.0 min region on the linkac Res. 3:137-155(1996).
-!- SUBCELIULAR LOCATION: Integral membrane protein (PC-1- SIMILARITY: TO Y.PESTIS HMS LOCUS PROTEIN HMSR AND S.EPIDERMIDIS ICAA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Science [2]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=K12 / MG1655;
MEDLIND=97426617; PubMed=9278503;
MEDLIND=97426617; PubMed=9278503;
Blatther F.R., Plunkett G. III, Bloch C.A., Perna N.T., Burland V Riley M., Collado-Vides J., Glasner J.D., Rode C.K., Mayhew G.F., Gregor J., Davis N.W., Kirkpatrick H.A., Goeden M.A., Rose D.J.,
                                                                                                                                                                                                                                                                                                                           entities requires a license agreement (S or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the El the European Bioinformatics Institute. There are no rest
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Oshima T., Aiba H., Baba T., Fujita K., Hayashi K., Honjo A., Ikemoto K., Inada T., Itoh T., Kajihara M., Kanai K., Kashimoto K., Kimura S., Kitagawa M., Makino K., Masuda S., Miki T., Mizobuchi K., Mori H., Motomura K., Nakamura Y., Nashimoto H., Nishio Y., Saito N Sampei G., Seki Y., Tagami H., Takemoto K., Wada C., Yamamoto Y., Yano M., Horiuchi T.;
                                                                                                                                                                TRANSMEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Escherichia coli
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                                                                                                                                                                                                                                Hypothetical
                                                                                                                                                                                                                                              Pfam;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Mau B., Shao Y.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.
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            63
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ISNPRNIGFIASINIGLDELAKSGGGEYIARTDADD-----IASPGWIEKIVGEME 113
                                                                 PLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRIRI 62
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       complete genome sequence of Escherichia coli K-12."; nce 277:1453-1474(1997).
                                       PSISIIIPCFNEEKNVEETIHAALAQRYENIEVIAVNDGSTDKTRAILDRMAAQIPHLRV 134
                                                                                                                                                                                                         D90739; BARNIE COMPLETE COMPLETE COMPLETE COMPLETE COMPLETE COMPLETE COMPLETE COMPLETE COMPLETE POTENTIAL.
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(Rel. 35, Last sequence update)
(Rel. 40, Last annotation update)
                                                                                             Conservative
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RA Azevedo V., Bertero M.G., Bessieres P., Bolotin A., Borchert S.,
RA Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.,
RA Borriss R., Boursier L., Brans A., Braun M., Brignell S.C., Bron S.,
RA Borriss R., Bruschi C.V., Caldwell B., Capuano V., Carter N.M.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Daniel R.A.,
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RA Choi S.K., Codani J.J., Connerton I.F., Cummings N.J., Galleron N.,
RA Choi S.K., Codani J.J., Haga K., Haich J., Galizzi A., Galleron N.,
RA Glim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G.,
RA Glim S.Y., Glaser P., Goffeau A., Golightly E.J., Grandi G.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Hilbert H., Holsappel S., Hosono S., Hullo M.F., Itaya M., Jones L.,
RA Joris B., Karamata D., Kashhara Y., Klaerr-Blanchard M., Klein C.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Kurita K., Lapidus A., Lardinois S., Lauber J., Lazarevic V.,
RA Medina N., Mellado R.P., Mizuno M., Moestl D., Nakai S., Noback M.,
RA Noone D., O'Reilly M., Ogawa K., Ogiwara A., Odega B., Park S.H.,
RA Noone D., O'Reilly M., Ogawa K., Ogiwara A., Odega B., Park S.H.,
RA Ra Hilbert M., Parchelle B., Racpoort G., Rey M., Reynolds S.,
RA Rabger M., Rivolta C., Rocha E., Roche B., Rose M., Sadaie Y.,
RA Sekiguchi A., Tanakoshi A., Tanaka T., Terpstra P., Tognoni A.,
RA Viari A., Wambutt R., Wedler E., Wedler H., Weiler F., Vassarotti A.,
RA Viari A., Wambutt R., Wedler E., Wedler H., Weiler H., Weiler H., Weiler M., Weiler M., Weiler M., Weiler M., Weile
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P39614;
                                       Viari A., Wambutt R., Wedler E., Wedler H., Weitzenegger T., Winters P., Wipat A., Yamamoto H., Yamane K., Yasumoto K., Yasyoshida K., Yoshikawa H.F., Zumstein E., Yoshikawa H., Danchi "The complete genome sequence of the Gram-positive bacterium
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Hullo M.F., Ionescu M., Lubochinsky B., Marcelino L., Moszer I.,
Presecan E., Santana M., Schneider E., Schweizer J., Vertes A.,
Rapoport G., Danchin A.;
"Bacillus subtilis genome project: cloning and sequencing of the
kb region from 325 degrees to 333 degrees.";
Nol. Microbiol. 10:371-384(1993).
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Bacillus subtilis.
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                                                                   Danchin A.
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RESULT 14
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ID YF20_M
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DD HYPOCH
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OS MYCODA
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Best Local (
Cole S.T., Brosch R., Parkhill J., Garnier T., Churcher C., Harris Gordon S.V., Eiglmeier K., Gas S., Barry C.E. III, Tekaia F., Badcock K., Basham D., Brown D., Chillingworth T., Connor R., Davies R., Devlin K., Feltwell T., Gentles S., Hamlin N., Holroyd Hornsby T., Jagels K., Kroph A., McLean J., Moule S., Murphy L., Oliver S., Osborne J., Quail M.A., Rajandream M.A., Rogers J., Rutter S., Seeger K., Skelton S., Squares S., Squares R., Sulston J.E., Taylor K., Whitehead S., Barrell B.G.; "Deciphering the biology of Mycobacterium tuberculosis from the complete genome sequence."; Nature 393:537-544(1998).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      01-NOV-1997 (Rel. 35, Created)
01-NOV-1997 (Rel. 35, Last sequence up
15-JUN-2002 (Rel. 41, Last annotation
Hypothetical protein Rv1520,
RV1520 OR MT1570 OR MTCY19G5.08C.
                                                                                                                                                                                                                                                                                                                                              MEDLINE=98295987; PubMed=9634230;
                                                                                                                                                                                                                                                                                                                                                                                 STRAIN=H37Rv;
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InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
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EMBL; Z99123; CAB15824.1;
PIR; S39711; S39711.
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Best Local S
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16-OCT-2001 (Rel. 40, Created)
16-OCT-2001 (Rel. 40, Last sequence up
15-JUN-2002 (Rel. 41, Last annotation
McLaughlin R., Abu "Characterization influenzae.";
                                                                                                             SEQUENCE FROM
                                                                                                                                                                                                                    Bacteria; Proteobacteria;
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Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Complete proteome.
SEQUENCE 346 AA; 39578 MW; 22EDA40495E0EFCA CRC64;
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                                                                                   STRAIN=A2;
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                                                                                                                                                                                                                                             Haemophilus influenzae
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Fleischmann R.D., Alland D., Eisen J.A.,
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AE007024; AAK45837.1; ALT_INIT
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Pfam; PF00535; Glycos_transf_2; 1.
Hypothetical protein; Transferase; Glycosyltransferase;
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Fleischmann R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F., Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M., McKenney K., Sutton G., Fitzhugh W., Fields C.A., Gocayne J.D., Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M., Weidman J.F., Phillips C.A., Spriggs T., Hedblom E., Cotton M.D., Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C., Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M., Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O., Venter J.C.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entitles requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Science 269:496-512(1995).
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EMBL; U32842; AAC23341.1; -.
TIGR; H11695; -.
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                                                                                                                                                                                              KEEIRAG
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267 AA;
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46 D
49 F
30770 MW;
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                                2002, 11:56:29
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D -> E (IN REF. 1).
F -> S (IN REF. 1).
; A2F1A0532737D8C3 CRC64;
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Maximum
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1: sp_archea:*
2: sp_bacteria
3: sp_fungi:*
4: sp_human:*
5: sp_inverteb:
6: sp_mammal:*
7: sp_mhc:*
8: sp_organel!
9: sp_plane:*
10: sp_plane:*
11: sp_rodent:
12: sp_virus:*
13: sp_verteb:
13: sp_verteb:
14: sp_unclass
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Copyright (c) 1993 - 2002 Compugen Ltd.
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sp_bacteria:*
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Q9JW66
Q9L8E9
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Q9CLR9
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2398.732 Million cell updates/sec
      Q50949 neisseria g
Q9evd5 neisseria m
Q51115 neisseria m
Q51115 neisseria g
Q519x6 neisseria g
Q50946 neisseria g
Q50951 neisseria g
Q50951 neisseria g
Q50951 neisseria m
Q50966 neisseria m
Q51860 neisseria g
Q50187 pasteurella
Q502179 pasteurella
Q5021860 neisseria m
Q50366 neisseria m
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	p71057 hacillus su	O8vlb0 streptococc	anabaena	Q8ysm2 anabaena sp	082874 streptococc		pyrococc	anabaena			Q8u2r3 pyrococcus	P71054 bacillus su	σ	shigella k		4	σ	Q8yup7 anabaena sp	Q9k615 bacillus ha	Q97h40 clostridium	087159 vibrio chol	Q97h39 clostridium	Q91a88 aeromonas h	Q93ek8 neisseria m	P96944 neisseria m	Q97h38 clostridium	Q98jh2 rhizobium 1	Q92v61 rhizobium m	P74947 vibrio chol

ALIGNMENTS

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Matches 337
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J. Exp. Med. 180:2181-2190(1994).
EMBL; U14554; AAA68012.1; -.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PP00535; Glycos_transf_2; 1.
Transferase.
SEQUENCE 337 AA; 38393 MW; 5AE21AA75CAA73
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050949; Ol-NOV-1996 (TrEMBLrel. 01,
01-NOV-1996 (TrEMBLrel. 01,
01-JUN-2001 (TrEMBLrel. 17,
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Bacteria; Proteobacteria;
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 121 MGAWLEVLSEENNKSVLAAIARNGAIWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDG 180
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                                                                                                     1 MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                                             RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                     MQPLVSVLICAYNAEKYFAQSLAAVVGQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60
                            RIISNPRNLGFIASLNIGLDELAKSGGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIA 120
                                                                                                                                                                Similarity
                                                                                                                                             100.0%; Score 1764; DB 2; ilarity 100.0%; Pred. No. 4.8e-137; Conservative 0; Mismatches 0;
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Last annotation update)
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Matches 218
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Q9EVD5;
01-MAR-2001 (TIEMBLIEL 1
01-MAR-2001 (TIEMBLIEL 1
01-JUN-2002 (TIEMBLIEL 2
                       Q51115
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Arking D., Tong Y., Stein D.C.;
"Analysis of lipooligosaccharide biosynthesis
J. Bacteriol. 183:934-941(2001).
EMBL; AF240672; AAG09764.1; -.
HSSP; P39621; 10GQ.
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Bacteria; Proteobacteria;
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                                                                                                                                                                                           TARNOFLQSMGFKTRFDSLEYRQIKAVAYELLEKHLPEEDFERARRFLYQCFKRTDTLPA
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PF00535; Glycos_transf_2; 1.
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16, Last sequence up
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Pred. No. 1
                     PRT;
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Q9JXQ6;
01-OCT-2000
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Bacteria; Proteo
NCBI_TaxID=487;
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                       Tettelin H., Saunders N.J., Heidelberg J., Jeffries A.C., N
Eisen J.A., Ketchum K.A., Hood D.W., Peden J.F., Dodson R.J
Helson W.C., Gwinn M.L., DeBoy R., Peterson J.D., Hickey E.
Haft D.H., Salzberg S.L., White O., Fleischmann R.D., Dough
                                                                                                                                            SEQUENCE FROM N.A.
STRAIN-MC58 / SEROGROUP B;
MEDLINE-20175755; PubMed-10710307;
                                                                                                                                                                                                                                                                                               Neisseria meningitidis (serogroup B).
Bacteria; Proteobacteria; beta subdivision;
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01-NOV-1996 (TrEMBLrel.
01-DEC-2001 (TrEMBLrel.
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                                                                                                                                                                                                                                                                 NCBI_TaxID=491;
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Pr00535; Glycos_transf_2; 1.
NCE 333 AA; 38563 MW; 49D8F6
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Proteobacteria;
     Ciecko
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tetraose biosynthesis glycosyl transferase
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Parksey D.S.,
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9; Mismatches
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                                                                                                                                                "Characterization of lipooligosaccharide gonorinoeae PID2.";
                                                                                                       Submitted (OCT-2000) to the EMBL/GenBank/DDBJ EMBL; AF313394; AAK70338.1; . InterPro; IPR001173; Glycos transf_2. Pf400; PF00535; Glycos_transf_2; 1.
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01-MAR-2002
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Pfam; PF00535; Glycos_transf_2; 1.
Transferase; Complete proteome.
SEQUENCE 349 AA; 40618 MW; 4B9E24
                                                                                                 Transferase
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Bacteria; Proteobacteria;
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EMBL; AE002541; AAF42258.1;
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                                                 Score 1055;
Pred. No. 1
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Pred. No. 7.56
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                                                                                    37C680CD23B149B4 CRC64;
                                                                                                                                                                                                                                        subdivision;
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Q50946;
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01-NOV-1996 (TrEMBLrel. 0
01-JUN-2001 (TrEMBLrel. 1
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Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE
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J. Exp. Med. 180:2181-2190(1994).
EMBL; U14554; AAA68009.1; -.
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                                                                                                                                                                                                                                                                                                                  RIISNPRNLGFIASLNIGLDELAKS--GGGEYIARTDADDIASPGWIEKIVGEMEKDRSI 118
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                                             KEEIRAGYWKAAGIAVGADCLNYGLLKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKY
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Pred. No. 3.6e
33; Mismatches
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OS Neisseri
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RP SEQUENCE
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Harvey H.A., Porat N., Campbell C.A., Je
Phillips N.J., Apicella M.A., Balke M.S.
"Gonococcal lipooligosaccharide is a lig
receptor on human sperm.";
Mol. Microbiol. 36:1059-1070(2000).
EMBL; AF121135; AAF14359.1; -
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
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Q50951;
01-NOV-1996 (TREMBLE
01-NOV-1996 (TREMBLE
01-JUN-2001 (TREMBLE
Glycosyltransferase.
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01-MAY-2000
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Glycosyltran
             Neisseria gonorrhoeae.
Bacteria; Proteobacteria;
 NCBI_TaxID=485;
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Proteobacteria;
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Pred. No. 4.4e-78;
5; Mismatches 84;
                                                                                                                       PRT;
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DT 01-OCT-2000
DT 01-DEC-2001
DE Lacto-N neoto
GN LGTA OR NMAD)
OS Neisseria men
OC Bacteria; Pro
OX NCBLTAXID=66
RN [1]
RY MEDLINE=2022
RA Klee S.R., M
RA MAITCHEAS K., LA
RA Gavies R.M., Jagels K., LA
RA Whitchead S., LA
RA WHITCHEAL
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EMBL; U15992; AAA92074.1; -.
EMBL; U15992; AAA92074.1; -.
ThterPro; IPR001173; Glycos_transf_2.
                                                                                                                                                                                  STRAIN=22491 / SEROGROUP A / SEROTYPE 4A;

MEDLINE=20222556; PubMed=10761919;

Parkhill J., Achtman M., James K.D., Bentley S.D., Churche Klee S.R., Morelli G., Basham D., Brown D., Chillingworth Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Jagels K., Leather S., Moule S., Mungall K., Quail M.A., Jagels K., Leather S., Moule S., Simmonds M., Skelton J., Rutherford K.M., Simmonds M., Skelton J.,
                                                                                                                                                                                                                                                                                                                                                                                                                                  01-0CT-2000 (TrEMBLrel. 15, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
Lacto-N-neotetraose biosynthesis glycosyl tranferase.
LGTA OR NAA0524.
Neisseria meningittidis (serogroup A).
Bacteria; Proteobacteria; beta subdivision; Neisseria
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STRAIN-96099316; PubMed-8522539;
                        Naturé 404:502-506(2000).

EMBL; AL162753; CAB83816.1; -.

InterPro; IPR001173; Glycos_transf_2.

Pfam; PF00535; Glycos_transf_2; 1.
                                                                                                                    Whitehead S., Spratt B.G., Barrell B.G., "Complete DNA sequence of a serogroup A meningitidis Z2491.";
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Stein D.C.;
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SEQUENCE FROM N.A.
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InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
SEQUENCE 321 AA; 37052 MW; 6ACADA9A3CB738FA CRC64;
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01-OCT-2000
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Bacteria; Proteobacteria;
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| GGGEYIARTDADDIASPGWIEKIVGEMEKDRSIIAMGAWLEILSEEKDGNRLARHHRHGA 120
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         LAYYPEALVKYRFHQDQTSSKYNLQQRRTAWKIKEEIRAGYWKAAGIAVGADCLNYGLLK
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MQPLVSVLICAYNVEKYFAQSLATVVNQTWRNLEILIVDDGSTDGTLAIAKDFQKRDSRI 60
                                                                                 IWDKPTRHEDIVAVFPFGNPIHNNTMIMRRSVIDGGLRFDPAYIHAEDYKFWYEAGKLGR 205
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        TDLLDFLTDRVMRKLFAAPQYRKILKKMLR 330
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EIRAGYWKAAGIAVGADCLNYGILKSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSL
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                                                                                                                                                                                                                                                                                   191;
                                                            {\tt IWDKPTRHEDIAAFFPFGNPIHNNTMIMRRSVIDGGLRYDTGRDWAEDYQFWYDVSKLGR}
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63.38;
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15,
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Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Created)
                                                                                                                                                                                                                                                                                Score 953; DB 2;
Pred. No. 2.6e-70;
4; Mismatches 80
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Pred. No. 2.4e-77;
5; Mismatches 86;
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                                                                                                                                                                                                                                                                                  80;
                                                                                                                                                                                                                                                                                                                    Length 321;
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       RESULT 12
Q9CLR9
ID Q9CLR
AC Q9CLR
DT 01-JU
DT 01-DE
DE Hypot
GN PM114
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ID Q9L8F0
ID Q9L8F0
O9L8F
AC Q9L8F
D7 01-Q0
D7 01-Q0
D7 01-J0
D8 LGTA,
GN HALLE
GN NCBIL
RA BAILT
RA Submin
DR TINEER
DR SUBMIN
DR LMBL;
SQ SEQUE
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Query Match
Best Local S
Matches 191
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Q9L8F0;
01-OCT-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Submitted (NOV-1999) to the EMBL/GenB
EMBL; AF208058; AAF25876.1; -.
InterPro; IPR0011173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
SEQUENCE 322 AA; 37109 MW; 88FECA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     01-OCT-2000 (TrEMBLrel. 15, 01-OCT-2000 (TrEMBLrel. 15, 01-JUN-2001 (TrEMBLrel. 17,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Neisseria gonorrhoeae.
Bacteria; Proteobacteria;
NCBI_TaxID=485;
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                                                                                                                                                                                                                                             LKKMLR 330
                                                                                                                                                                                                                                                                                  KAAAYELPEKDLPEEDFERARRFLYQCFKRTDTPPSGAWLDFAADGRMRRLFTLRQYFGI
                                                                                                                                                                                                                                                                                                                    KSTAYALYEKALSGQDIGCLRLFLYEYFLSLEKYSLTDLLDFLTDRVMRKLFAAPQYRKI 324
                                                                                                                                                                                                                                                                                                                                                        RLAYYPEALVKYRLHANQVSSKHSVRQHEIAQGIQKTARNDFLQSMGFKTRFDSLEYRQT
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Last annotation update)
                                         Last annotation update)
                                                                            Created)
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Pred. No. 1.
                                                                                                                    PRT;
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                                                            sequence update)
                                                                                                                    337
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85

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60

180 204 120

Pasteurella multocida.

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RESULT
Q93EK6
ID Q9
AC Q9
DT Q1
DT Q1
OT Q
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Query Match
Best Local Sim
Matches 121;
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Best Local S
Matches 156
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Q93EK6;
Q93EK6;
01-DEC-2001
01-DEC-2001
01-DEC-2001
                                                                                              Zhu P., Klutch M.J., Tsai C.-M.;
Genetic Analysis of Conservation and Variation of Lipooligosaccharide
"Genetic Analysis of Conservation and Variation of Lipooligosaccharide
"Genetic Analysis of Conservation of Neisseria meningitidis.";
FEMS Microbiol. Lett. 203:173-177(2001).

EMBL; AF355193; AAL12840.1; -.

SEQUENCE 221 AA; 26478 MW; D1F97099B1F6D55F CRC64;
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"Complete genomic sequence of Pasteurella multocida Pm
Proc. Natl. Acad. Sci. U.S.A. 98:3460-3465(2001).

EMBL; AE006155; AAK03224.l; -
EMBL; AF001173; Glycos_transf_2.

Pfam; PF00535; Glycos_transf_2.

Hypothetical protein; Complete proteome.

SEQUENCE 337 AA; 39267 MW; 8639BCFB5F700DB4 CRC64;
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                                                                                                                                                                                                                                                                                                                                                                   Neisseria;
Bacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE-21145866; PubMed-11248100;
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                                                                                                                                                                                                                                                                                                                                                                                                                                            LgtA.
                                                                                                                                                                                                                                            MEDLINE=21467954; PubMed=11583844;
                                                                                                                                                                                                                                                                       STRAIN-M978
                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                          NCBI_TaxID=487;
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Proteobacteria;
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Pred. No. 1.7e-
56; Mismatches
                           Score 588; DB 2;
Pred. No. 1.7e-40;
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Best Local
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P96946;
01-MAY-1997 (TrEMBLrel. (
01-MAY-1997 (TrEMBLrel. (
01-JUN-2002 (TrEMBLrel. )
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01-MAY-2000
01-MAY-2000
01-DEC-2001
                                                                                                       Neisseria
Bacteria;
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Harvey H.A., Porat N., Campbell C.A., Jennings M.,
Phillips N.J., Apicella M.A., Balke M.S.;
"Gonococcal lipcoligosaccharide is a ligand for the
receptor on human sperm.";
Mol. Microbiol. 36:1059-1070(2000).
EMBL; AF121135; AAF14362.1; -.
InterPro; IPR001173; Glycos_transf_2.
Pfam; PF00535; Glycos_transf_2; 1.
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Bacteria; Proteobacteria;
NCBI_TaxID=485;
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MEDLINE=20055626;
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    PubMed=10589709;
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RA Jennings M.P., Srikhanta Y.N., Moxon E.R., Kramer M., Poolman J.T.,
RA Kuipers B., van der Ley P.;
RT "The genetic basis of the phase variation repertoire of
RT lipopolysaccharide immunotypes in Neisseria meningitidis.";
RL Microbiology 145:3013-3021(1999).

BR LMICROBIOLOGY 145:3013-3021(1999).

BR HSSP; 195621; 1QGQ.

DR HSSP; 195621; 1QGQ.

PR HSSP; 195621; 1QGQ.

DR ToterPro: IPR001173; Glycos_transf_2: 1.

RW Transferase.

SQ SEQUENCE 149 AA; 16867 MW; 68A52EB7DF6B552A CRC64;

Query Match
Best Local Similarity 83.3%; Score 415; DB 2; Length 149;
Best Local Similarity 83.3%; Pred. No. 1.6e-26;
Matches 85; Conservative 3; Mismatches 12; Indels 2; Gaps 1;

QY 1 MQPLVSVLICAYNAEKYFAQSLAAVVQTWRNLDILIVDDGSTDGTPAIARHFQEQDGRI 60

QY 1 MQPLVSVLICAYNAEKYFAQSLAAVVQTWRNLEILIVDDGSTDGTPSIARRFQEQDGRI 60

QY 61 RIISNPRNLGFTASLNIGLDELAKSGGGEYIARTDADDIASP 102

G1 RIISNPRNLGFTASLNIGLDELAKSGGGEYIARTDADDIASP 102

Search completed: December 2, 2002, 12:02:18

Job time: 29.9477 secs
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    2, 2002, 11:55:41; Search time 29.0623 Seconds
(without alignments)
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AAW06580
AAR922156
AAW89331
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N. gonorrhoeae gly
Lipo-oligosacchari
N. gonorrhoeae gly
N. meningitidis Be
Neisseria meningit
Drosophila melanog
Human polypeptide
Human polypeptide
Human polypeptide,
Human polypeptide,
                                                                                                                                                                                                                                                                                                                                                                             Description
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45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11
85	85	85	85.5	86	86	87	87.5	87.5	87.5	87.5	87.5	88.5	90.5	90.5	91	94	94	95	97	97	99	103	104	106.5	108.5	109	127	127	127	127	•	129.5	9.	129.5
5.9	5.9								6.1			6.1	6.3	6.3	6.3	6.5	6.5	6.6	6.7	6.7	6.9	7.2	7.2	7.4						•		9.0		9.0
762	753	439	653	526	291	1674	1343	1129	662	662	657	161	1214	991	389	4010	767	273	444	273	394	279	273	201	168	739	622	622	622	521	636	595	579	578
22	20	22	23	22	23	19	22	19	22	21	22	23	16	16	22	22	22	20	23	22	18	18	22	18	22	22	23	22	22	21	23	21	20	22
AAU35926	AAY37247	AAU30597	ABB47763	AAB92861	ABB49964	AAW81169	AAU33259	AAW77286	AAU36547	AAB08632	AAU33784	AAE15943	AAR80097	AAR80096	AAB82459	ABB61520	ABG11534	AAY32543	AAU76669	AAB60321	AAW24257	AAW21023	AAB60317	AAW20604	ABG22090	ABB11417	ABP43477	AAB88452	AAM93427	AAB41900	ABP42016	AAB12121	AAY30812	AAG81257
Helicobacter pylor	Protein involved i	Novel human secret	Listeria monocytog	Human protein sequ	Listeria monocytog		Novel human secret	Bovine differentia	Staphylococcus aur	Amino acid sequenc	Staphylococcus aur	Worm C38H2-2/141-3	Black widow spider	Black widow spider	Caenorhabditis ele	Drosophila melanog	Novel human diagno	H. pylori beta-1,4	Helicobacter pylor	Helicobacter pylor	Aquifex aspartate	H. pylori cytoplas	Helicobacter pylor	\mathbf{L}	human dia	secreted			Human polypeptide,	Human ORFX ORF1664	Human ovarian anti	Hydrophobic domain	Human secreted pro	Human AFP protein

ALIGNMENTS

RESULT 1 AAR91315

AAR91315 standard; Protein; 280

A

N. gonorrhoeae glycosyltransferase LgtE.

09-JUL-1996

(first entry)

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Nucleic acids encoding glycosyl transferase(s) diagnosis of infection with Neisseria and for oligo:saccharide(s)
                                                                                                                                                                       Glycosyltransferase; lipo-oligosaccharide;
                               N-PSDB; AAT14061
                                       WPI; 1996-200924/20
                                                      Gotschlich
                                                                                                                    04-APR-1996
                                                                                                                                   W09610086-A1.
                                                                                                                                                Neisseria gonorrhoeae strain F62
                                                                     (UYRQ ) UNIV ROCKEFELLER.
                                                                                     26-SEP-1994;
                                                                                                   25-SEP-1995;
                                                                                    94US-0312387
                                                                                                   95WO-US12317
                                                                                                                                                                      lgt gene; LOS locus;
        ) - used in the the biosynthesis
        of.
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AAWO6580
XX
XX
AC AAWC
XX
AC AAWC
XX
DT 21-Y
XX
W PO1;
KW N-ac
XX
NO9;
XX
WO9
XX
WO9
XX
PD 19-;
YX
PF 03-,
XX
PF 03-,
XX
PF 03-,
XX
PF 08-c
PT Buc
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PT Tra
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         igtE (AAR)1315) can be obtd. by expression of the lgtE coding sequence in recombinant host cells. A method for adding Gal betal-4 to GlcNac or Glc comprises contacting a reaction mixture contg. activated Gal to an acceptor molety comprising a GlcNAc or Glc residue in the presence of LgtE. Oligosaccharides can be produced that, when attached to non-toxic lipids, are useful for Neisseria vaccine prepn. Blood group core oligosaccharides, and minics of lacto-N-neotetraose, gangliosides and saccharide portions of globoglycolipids can also be produced using the enzymes.
  Transfer of at least
                                                                                                                            07-JUN-1995;
                                                                                                                                                       03-JUN-1996;
                                                                                                                                                                                   19-DEC-1996.
                                                                                                                                                                                                                                       Neisseria gonorrhoeae ATCC 33084
                                                                                                                                                                                                                                                               Polyglycosyltransferase; N-acetylglucosaminyl transferase; N-acetylgalactosaminyl transferase; lipo-oligosaccharide.
                                                                                                                                                                                                                                                                                                                                       21-MAR-1997
                                                                                                                                                                                                                                                                                                                                                                                              AAW06580 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      5 Glycosyltransferases (AAT14061) of Neiserria
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                                           1997-052351/05
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK 240
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12;
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280; Conserv
                                                                      SL,
                              AAT49230
                                                                                                NEOSE TECHNOLOGIES
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                                                                      Johnson
                                                                                                                                                                                                                                                                                                                                         (first
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Neiserria gonorrhoeae strain
                                                                                                                            95US-0478140
                                                                                                                                                       96WO-US08323
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                                                                                                                                                                                                                                                                                                                                         entry)
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  N
                                                                      ΧŦ,
                                                                                                                                                                                                                                                                                                            gene-encoded protein.
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 saccharide units
                                                                      Roth S;
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Pred. No. 6.4e-148;
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using
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RESULT 3
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Best Local S
Matches 278
Nucleic acids encoding glycosyl transferase(s) diagnosis of infection with Neisseria and for oligo:saccharide(s)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A lipooligosaccharide-encoding gene region (AAT49230) of Neisseria gonorrhoeae ATCC 33084 includes coding sequences for 5 proteins (AAW06576-80), one of which (AAW06576) is a polyglycosyltransferase that catalyses the addition of GlcNAc and GalNAc disaccharides to a paragraphy of the content of the other 4 proteins is not
                                                      P-PSDB; AAT14061.
                                                                                                                                                                         25-SEP-1995;
                                                                                                                                                                                                   04-APR-1996
                                                                                                                                                                                                                                                     Neisseria gonorrhoeae strain F62
                                                                                                                                                                                                                                                                                           Glycosyltransferase; lipo-oligosaccharide;
                                                                                                                                                                                                                                                                                                                                               09-JUL-1996
                                                                                                                                                                                                                                                                                                                                                                                                  AAR91312 standard; Protein; 279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            stated in
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                                                                                                                     (UYRQ ) UNIV
                                                                                                                                               26-SEP-1994;
                                                                                                                                                                                                                             WO9610086-A1
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mes 278; Conser
                                                                                                                                                                                                                                                                                                                       gonorrhoeae glycosyltransferase LgtB
                                                                 1996-200924/20
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WEDLKRALGKEGREKKKRMERQRQAELEKVYGRRVILFK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      LETMFAKVIVRPDFVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   VDLMMFTYFFDLEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the specification.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    280 AA;
                                                                                                                                                                                                                                                                                                                                                 (first entry)
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                                                                                                                     ROCKEFELLER
                                                                                                                                               94US-0312387
                                                                                                                                                                         95WO-US12317.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2F-H; 38pp;
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Pred. No. 2.7e-146;
0; Mismatches 2;
                                                                                                                                                                                                                                                                                           lgt gene; LOS locus;
            ) - used in the the biosynthesis
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WPI;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            5 Glycosyltransferases (AAR91311-15) are products of the lgt locus (AAT14061) of Neiserria gonorrhoeae strain F62. Glycosyltransferase LgtB (AAR91312) can be obtd. by expression of the lgtB coding sequence in recombinant host cells. A method for adding Gal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       betal-4 to GlcNAc or Glc comprises contacting a reaction mixture contg. activated Gal to an acceptor moiety comprising a GlcNAc or Glc residue in the presence of LgtB. Oligosaccharides can be produced that, when attached to non-toxic lipids, are useful for
                           Gilbert M, Wakarchuk WW,
                                                                                 14-DEC-1998;
15-DEC-1997;
                                                                                                                                                   24-JUN-1999.
                                                                                                                                                                             WO9931224-A2
                                                                                                                                                                                                       Neisseria meningitidis
                                                                                                                                                                                                                                   carbohydrate structure
                                                                                                                                                                                                                                            glycosyltransferase; accessory enzyme; nucle
saccharide donor; oligosaccharide synthesis;
                                                                                                                                                                                                                                                                         Beta-1,4-galactosyltransferase; lgtB; fusion protein; catalytic domain;
                                                                                                                                                                                                                                                                                                    N. meningitidis Beta-1,4-galactosyltransferase.
                                                                                                                                                                                                                                                                                                                                08-SEP-1999
                                                                                                                                                                                                                                                                                                                                                            AAY22156;
                                                                                                                                                                                                                                                                                                                                                                                    AAY22156 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Neisseria vaccine prepn. Blood group core oligosaccharides, and mimics of lacto-N-neotetraose, gangliosides and saccharide portions of globoglycolipids can also be produced using the enzymes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Claim 9;
                                                                                                                        15-DEC-1998;
                                                     (CANA ) NAT
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1999-395174/33
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ----RHRRSLKVMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              VDLMMFGNPDDREGMPVCQLNPALCAQELHYAKFHDQNSALGSL1EHDRRLNRKQQWRDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VDLMMFTYFFDKEGMPYYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGR------
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   al Similarity
209; Conserv
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                                                     RES COUNCIL CANADA
                                                                                                                                                                                                                                                                                                                              (first entry)
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                                                                                98US-0211691.
97US-0069443.
                                                                                                                        98WO-CA01180
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71.6%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                       -LIRALTKIGREREKRRORR-----EQLIGKIIVPFQ
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                                                                                                                                                                                                                                  development
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ; Score 1036.5; DB 1; Pred. No. 4.7e-104; 24; Mismatches 34;
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                            ZX.
                                                                                                                                                                                                                                                             nucleotide
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                                                                                                                                                                                                                                                             sugar formation;
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RESULT 5
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  cc galactosyltransferase (also referred to as lgtB). The invention relates ct on nucleic acid encoding a fusion protein that comprises a glycosyltransferase catalytic domain and a catalytic domain from an cacessory enzyme that is involved in formation of a nucleotide sugar which is a saccharide donor for a glycosyltransferase reaction. The cubic protein is useful in the enzymatic synthesis of oligosaccharides. The fusion proteins are able to catalyse more than one reaction involved in the enzymatic synthesis. This is useful for the development of the therapeutic agents that have specific carbohydrate structures. Cc Carbohydrates are involved in recognition elements on the surface of cells. The fusion protein can be used for the synthesis of both natural carbohydrates and synthetic derivatives with novel properties. The fusion copolypeptide allows two glycosyltransferase reactions in a single vessel, copolypeptide allows two glycosyltransferase reactions in a single vessel, copolypeptide allows two glycosyltransferase reactions in a single vessel, copolypeptide allows two glycosyltransferase reactions in a single vessel, copolypeptide allows two glycosyltransferase reactions in a single vessel, copolypeptide allows two glycosyltransferase reactions in a fingle vessel, completely different donor analogues and various acceptors of the ferminal calacteristics.
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Matches
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                                                                                                                                               Neisseria meningitidis; lgtC; lgtB; beta-1,4-galactosyltransferase; glycosyltransferase; proteolytic enzyme.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     N-PSDB; AAX84281.
                                                                                                           Neisseria meningitidis
                                                                                                                                                                                                    Neisseria meningitidis lgtE C-terminal peptide
                                                                                                                                                                                                                                           26-FEB-1999
                                                                                                                                                                                                                                                                                                                     AAW89331 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        with a terminal galactose
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKD----REQGRRHR
                                                                                                                                                                                                                                                                                                                                                                                                               PANTFKHRLIRALTKISREREKRRQRREQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                   RSLKVMFDLKRALGKFGREKKKRMERQRQ 265
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VDLMMFSDFFDREGMPVCQLNPALCAQELHYAKFHDQNSALGSLIEHDRLLNRKQQRRDS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LETMFMHVLTSPSGVADYCGRAFPLLESEHWGTAGYIISRKAMRFFLDRFAALPPEGLHP 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MQNHVISLASAAERRAHIADTFGRHGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG
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                                                                                                                                                                                                                                       (first entry)
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                                                                                                                                                                                                                                                                                                                 peptide;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            residue.
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); Mismatches
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26-MAY-1998; 03-DEC-1998.

98WO-IB00975

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ABB62795
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A method has been developed of expressing a glycosyltransferase in a host cell. The method comprises introducing into the host cell a nucleic acid encoding the glycosyltransferase and incubating the host cell under conditions appropriate for expression of the glycosyltransferase, where the host cell substantially lacks a protease that cleaves polypeptides between two consecutive positively charged amino acid residues. The glycosyltransferase can be used in in vitro production of oligosaccharide structures which are potential therapeutic agents for use in the manipulation of cell-cell recognition events, particularly adhesion of bacteria and viruses to mammalian cells and leukocytended and cell interaction through selectins in inflammation. The
              N-PSDB; ABL06898
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              method provides more readily recoverable active glycosyltransferases than prior art methods involving mammalian glycosyltransferases. The present sequence represents a C-terminal peptide from Neisseria
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Expressing high levels of glycosyltransferases - comprises use of either host cells deficient in proteolytic enzymes or modified glycosyltransferase genes deleted in a proteolytic recognition si
                            WPI; 2001-656860/75
                                                                                                              23-MAR-2000; 2000US-191637P
11-JUL-2000; 2000US-0614150
                                                                                                                                                                                                                                            Drosophila melanogaster
                                                                                                                                                                                                                                                                        pharmaceutical.
                                                                                                                                                                                                                                                                                                                 Drosophila melanogaster polypeptide SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 meningitidis lgtE from the present invention.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Wakarchuk WW,
                                                                                  (PEKE
                                                                                                                                                       23-MAR-2001; 2001WO-US09231
                                                                                                                                                                                                                 WO200171042-A2
                                                                                                                                                                                                                                                                                        Drosophila;
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                                                                                                                                                                                                                                                                                                                                                                                                     ABB62795 standard;
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                                                                                                                                                                                                                                                                                                                                             26-MAR-2002
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        231 QGRRHRRSLKVMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                       QERRHRRSLKVMFDLKRALGKFGREKKKRMERQRQAELEKAYGRRVISFK 50
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                                                      JC,
                                                                                  PE CORP NY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Similarity
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                                                     Adams M,
                                                                                                                                                                                                                                                                                     developmental biology; cell signalling; insecticide;
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                                                                                                                                                                                                                                                                                                                                                                                                     Protein;
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                                                      PWD,
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                                                      Myers
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                                                      EW;
                                                                                                                                                                                                                                                                                                               ID NO 15177
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RESULT 7
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                                                                                                                                                                                                                                                                                                                        Cytostatic; immunosuppressive; nootropic; neuroprotective; antiviral; antiallergic; hepatotropic; antidiabetic; antiinflammatory; antiulcer vulnerary; anticonvulsant; antibacterial; antifungal; antiparasitic;
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neurological disease;
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                                                                                    29-NOV-2001.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PALC - - - - TQELHYAKFLSQNSMLGSD - - - - - - LEKDREQGRRHRRSLKVMFDLK - -
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                                                                                                                                                                                                                   therapy; cancer; immune disorder;
isease; infection; human; secreted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ata for this patent did not form part of the printed but was obtained in electronic format directly from
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Pred. No. 3.8e-06;
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Best Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        disease, multiple sclerosis, rheumatoid arthritis and ulcerative colitis; (c) cardiovascular disorders such as myocardial ischaemias; (d) wound healing; (e) neurological diseases e.g. cerebral anoxia and epilepsy; and (f) infectious diseases such as viral, bacterial, fungal
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          The nucleic acids, proteins, antibodies and (ant)agonists are useful in the diagnosis, treatment and prevention of: (a) cancer, e.g. breas and ovarian cancer and other cancers of the adrenal gland, bone, bone marrow, breast, gastrointestinal tract, liver, lung, or urogenital; (b) immune disorders e.g. Addison's disease, allergies, autoimmune haemolytic anaemia, autoimmune thyroiditis, diabetes mellitus, Crohn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (ABB89040-ABB90444) useful for preventing, treating or ameliorating medical conditions e.g. by protein or gene therapy. The genes are isolated from a range of human tissues disclosed in the specification.
                         Human; open reading frame; ORFX; detection; cytostatic; hepatotropic; vulnerary; antipsoriatic; antiparkinsonian; nootropic; neuroprotective; anticonvulsant; osteopathic; antiarthritic; immunosuppressant; cardiant
                                                           Human; open
                                                                                                 Human ORFX ORF1554 polypeptide sequence SEQ ID NO:3108
                                                                                                                                     08-FEB-2001
                                                                                                                                                                       AAB41790
                                                                                                                                                                                                     AAB41790 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Novel 1405 isolated polypeptides, useful for diagnosis, treatment and prevention of neural, immune system, muscular, reproductive,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                N-PSDB;
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              immunostimulant; thrombolytic;
                                                                                                                                                                                                                                                                                          326
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                                                                                                                                                                                                                                                                                                                                                                                             114 DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY-----IISREAMR 164
                                                                                                                                                                                                                                                                                                                                                                                                                             214 TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW 272
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 58
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     parasitic infections.
e: The sequence data for this patent did not form parent did not form parent specification, but was obtained in electronic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     invention
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                                                                                                                                                                                                                                                                                                                                                                                                                                                               -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  VISLARRPDRRERMLASIWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR 213
                                                                                                                                                                                                                                                                                          RMLPVDEFLPIMFDQHPNEQYKA-----HFWPRD-LVAFSAQPLLAA-PTHYA 371
                                                                                                                                                                                                                                                                                                                        FFL--DRFAVL-----PPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYA 212
                                                                                                                                                                                                                                                                                                                                                            DLIYLGRKQ---
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Similarity
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Pred. No. 3.
              coagulant; vasotropic;
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              antidiabetic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           format directly
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      423;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Crohn's
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
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DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY-----

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                                                                                                                                                           Matches
                                                                                                                                                                                                                                                                         nucleic acids can be used to express ORFX proteins in gene therapy rectors. The proteins and nucleic acids may be used to treat cancers, proliferative disorders, neurodegenerative disorders, osteoarthritis, graft vs host disease, cardiovascular disease, diabetes mellitus, hyperthension, hypothyroidism, cholesterol ester storage, systemic lupus erythematosus, severe combined immunodeficiency (SCID), AIDS, viral, bacterial or fungal infection, malaria, autoimmune disorders, asthma, allergies, aplastic anaemia, burns, wounds, bone and cartilage damage, nocturnal haemoglobinuria, antiinflammatory disease; to enhance coagulation; to inhibit thrombosis; and as a contraceptive.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAC74446 to AAC77606 encode the proteins given in AAB40237 to AAB43397, which represent the human ORFX open reading frames I to 3161. The ORFX sequences have activities such as: cytostatic; hepatotropic; vulnerary; antipsoriatic; antiparkinsonian; nootropic; neuroprotective; osteopathic; anticonvulsant; antiarthritic; immunosuppressant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                          antithyroid; and antianaemic. The sequences can be used for determining the presence of or predisposition to, or preventing or treating pathological conditions associated with an ORFX-associated disorder. The
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Novel nucleic acids and peptides derived from open reading useful for treating e.g. cancers, proliferative disorders, neurodegenerative disorders and cardiovascular disease -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   cholesterol ester storage; systemic lupus erythematosus; infection; severe combined immunodeficiency; malaria; autoimmune disorder; asthma; allergy; aplastic anaemia; nocturnal haemoglobinuria; burn; wound;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             antianaemic; gene therapy; cancer; proliferative disorder; hyperte neurodegenerative disorder; osteoarthritis; graft vs host disease; cardiovascular disease; diabetes mellitus; hypothyroidism; SCID; A
                                                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     antiinflammatory; antibacterial; antiviral; antifungal;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           immunostimulant; cardiant; thrombolytic; coagulant; vasotropic;
antidiabetic; hypotensive; dermatological; immunosuppressive;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Claim 11; Page 2331-2332; 5507pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Shimkets
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  05-APR-1999;
30-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        31-MAR-1999;
02-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           antiviral; antibacterial; antifungal; antirheumatic; antithyroid;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (CURA-) CURAGEN CORP.
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  305
                                                                      246 VISLARRPDRRERMLASLWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR 304
                                     58
                                                                                                                                                                            Local
                                                                                                                  5 VISLASAAERRAHIADTFGSRGIPFQFFDA----LMPSERLEQAMAELVPGLSAHPY--- 57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        sapiens.
TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW 363
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2000-602362/57.
DB; AAC75999.
                                     -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK 113
                                                                                                                                                           59;
                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     RA,
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                                                                                                                                                           Conservative
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99US-0127636
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                                                                                                                                                                            Score 129.5;
Pred. No. 4.
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Best Local S
Matches 59
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11-JAN-2000;
02-MAY-2000;
                                                                                                                                                                                                                               molecules have been determined. Primers for synthesising the full length CDNA are useful for clarifying the function of the protein encoded by the CDNA. The full length clones were obtained by construction of full length enriched cDNA libraries that were synthesised by the oligo-capping method. The primers enable the production of the full length cDNA easily without any special methods. The present sequence is a polypeptide encoded by a full length human cDNA of the invention. Note: The sequence data for this patent did not form part of the printed specification, but was obtained in CD-ROM format directly from EPO.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Human
                                                                                                                                                                                                        Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                        Claim 8; SEQ ID NO 2591; 1380pp + sequence listing; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                      830 Primers useful for synthesizing full length cDNA clones and their use in genetic manipulation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EP1130094-A2
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                                                                                                                                                                                                                                                                                                                                                                clones. 830 cDNA molecules encoding a human protein have been isolated and nucleotide sequences of 5'- and 3'-ends of the cDNA
                                                                                                                                                                                                                                                                                                                                                                                              The invention relates to primers for synthesising full length
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Wakamatsu
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 114
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                                                           58
DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY-----IISREAMR 164
                            TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW 363
                                                                                      VISLARRPDRRERMLASLWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR 304
                                                                                                                VISLASAAERRAHIADTFGSRGIPFQFFDA----LMPSERLEQAMAELVPGLSAHPY---
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                                                        -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG----EGAEQFLAEDTWLEERFDK 113
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                                                                                                                                              Similarity
59; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             full length
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; 2000JP-0118774.
; 2000JP-0183765.
                                                                                                                                              Conservative
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                                                                                                                                                                                                        ΑĀ;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ---VNPEKETAVEGLPGLVVAGYSYWTLAYALRLAGARKLLASQPLR 416
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            cDNA; cDNA synthesis; oligo-capping
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQ ID NO:
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                                                                                                                                                            9.0%;
25.1%;
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a T, Nagai K, Kojima
                                                                                                                                                         Score 129.5; DB 2
Pred. No. 4.8e-05;
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S, Otsuki
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T, Koga
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11-JAN-2000;
02-MAY-2000;
                                                                                                                                                                                                                               molecules have been determined. Primers for synthesising the full length cDNA are useful for clarifying the function of the protein encoded by the cDNA. The full length clones were obtained by construction of full length enriched cDNA libraries that were synthesised by the oligo-capping method. The primers enable the production of the full length cDNA easily without any special methods. The present sequence is a polypeptide encoded by a full length human cDNA of the invention. Note: The sequence data for this patent did not form part of the printed specification, but was obtained in CD-ROM format directly from EPO.
                                                                                                                                                                                                                                                                                                                                                               The invention relates to primers for synthesising full length cDNA clones. 830 cDNA molecules encoding a human protein have been isolated and nucleotide sequences of 5'- and 3'-ends of the cDNA.
                                                                                                                                                                                                       Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                          Claim 8; SEQ ID NO 2599; 1380pp + sequence listing; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                     830\ \mbox{Primers} useful for synthesizing full length cDNA clones and use in genetic manipulation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAM93206 standard;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Ota T,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           07-JUL-2000; 2000EP-0114089
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                                                                                                                                                            Local
                                                                                                              5 VISLASAAERRAHIADTEGSRGIPEQEEDA----LMPSERLEQAMAELVPGLSAHPY---
DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY-----IISREAMR
                            TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW
                                                      -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK 113
                                                                                     VISLARRPDRRERMLASLWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR
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su A, Sugiyama
                                                                                                                                                            Similarity
                                                                                                                                                                                                       517 AA;
                                                                                                                                              Conservative
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2000JP-0183765
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25.1%;
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ma T, Nagai
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                                                                                                                                                            Score 129.5; DB 2
Pred. No. 4.8e-05;
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K, Kojima
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.1257
                                                                                                                                                                                                                                                          to AAG81453. The secreted proteins can be used for directing the secretion of proteins of interest from a host cell including bacteria, fungal cells, and cultured higher eukaryotic cells. The present invention also describes fusion proteins, where a secreted protein of the invention is operably linked via a peptide bond or peptide linker to a second protein selected from the group consisting of maltose binding protein, an immunoglobulin constant region, a polyhistidine tag and a peptide given in AAG81453.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Human; secreted protein; secretion; bacterial cell; fungal cell; eukaryotic cell; fusion protein; maltose binding protein; immunoglobulin constant region; polyhistidine tag.
                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                  Claim 1; Page 121-122; 617pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                           Isolated polypeptide for directing secretion of proteins of interest from a host cell including, e.g. bacteria, includes contiguous amino acid residues of polypeptide with specified amino acids -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Conklin DC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (ZYMO ) ZYMOGENETICS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        20-OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20-OCT-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               26-APR-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WO200129221-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Human AFP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   10-SEP-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAG81257;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAG81257 standard; Protein; 578
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 417
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         364
  442
                             114
                                                         383
                                                                                                                324
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                                                                                                                                                                                      Local Similarity
                                                                                                                                            u
  DLIYLGRKQ----
                          DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY------IISREAMR 164
                                                                                                               VISLARRPDRRERMLASLWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR 382
                                                                                                                                         VISLASAAERRAHIADTFGSRGIPFQFFDA----LMPSERLEQAMAELVPGLSAHPY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RMLPVDEFLPIMFDQHPNEQYKA-----HFWPRD-LVAFSAQPLLAA-PTHYA 462
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FFL--DRFAVL-----PPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYA 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | :: | :
DLIYLGRKQ-----
                                                        TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW 441
                                                                        -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2001-300340/31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAH52108
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       protein sequence SEQ
                                                                                                                                                                                                                               578
                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  2000WO-US29052.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Yee DP;
                                                                                                                                                                                                                               A,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        99US-0160712.
                                                                                                                                                                                 9.0%;
25.1%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      -VNPEKETAVEGLPGLVVAGYSYWTLAYALRLAGARKLLASQPLR
-VNPEKETAVEGLPGLVVAGYSYWTLAYALRLAGARKLLASQPLR
                                                                                                                                                                       36;
                                                                                                                                                                                   Score 129.5; DB 2
Pred. No. 5.6e-05;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       ID NO:32
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A
                                                                                                                                                                       Mismatches
                                                                                                                                                                                                 DB 22;
                                                                                                                                                                       95;
                                                                                                                                                                       Indels
                                                                                                                                                                                                 Length
                                                                                                                                                                                                   578;
                                                                                                                                                                       45;
                                                                                                                                                                    Gaps
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RESULT 12
AAY30812
ID AAY30
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                                                                                                                                                          This invention describes novel isolated human genes and the secreted proteins they encode. The polynucleotides and their corresponding secreted polypeptides are useful for preventing, treating or ameliorating medical conditions e.g. by protein or gene therapy. Also pathological conditions can be diagnosed by determining the amount of the new polypeptides in a sample or by determining the presence of mutations in the new polynucleotides. Specific uses are described for the polynucleotides of the invention based on which tissues they are most highly expressed in, and include developing products for the diagnosis or treatment of cancer, tumours, neurodegenerative disorders, developmental abnormalities and fetal deficiencies, blood disorders, leukemias, disease. I upmbhomas: inflammation allocations in the diseases, hepatic and renal diseases. I upmbhomas: inflammation allocations in the disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Kyaw H,
Shi Y,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              09-FEB-1998;
09-FEB-1998;
09-FEB-1998;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Secreted protein; prevention; treatment; protein therapy; gene therapy; diagnosis; cancer; tumour; neurodegenerative disorder; blood disorder; developmental abnormality; fetal deficiency; leukenia; autoimmune; acne; hepatic disease; renal disease; lymphoma; inflammation; allergy; asthma; Alzheimer's disease; cognitive disorder; schizophrenia; obesity; sepsis; osteoporosis; arthritis; infection; AIDS; connective tissue disorder; transplant rejection; diabetes; psoriasis; cardiovascular disorder;
                reproductive disorders. The polypeptides or polynucleotides used as food additives or preservatives. The polypeptide are for identifying their binding partners. This sequence repressecreted protein described in the invention.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      09-FEB-1998;
09-FEB-1998;
                                                                                        disorders, schizophrenia, obesity, osteoporosis, arthritis, infections, AIDS, connective tissue disorders, transplant rejection, diabetes, asthma, sepsis, acne, psoriasis, cardiovascular disorders, and
                                                                                                                                                                                                                                                                                                                                                                                                                         Claim 1b; Page 206-208; 263pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                             New isolated human genes potentially useful for, e.g. developmental abnormalities and fetal deficiencies {\sf and}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                04-FEB-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     early promoter;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   transplant rejection; diabetes; psoriasis; cardiovascular disord reproductive disorder; food additive; food preservative; human;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAY30812
                                                                                                                                                disease, lymphomas, inflammation, allergies, Alzheimer's and cognitive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        (HUMA-)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     12-AUG-1999
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DB; AAZ00803.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RMLPVDEFLPIMFDQHPNEQYKA-----HFWPRD-LVAFSAQPLLAA-PTHYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HUMAN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                standard; Protein; 579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Lafleur DW,
lei Y;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          GENOME
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98US-0074118.
98US-0074141.
98US-0074157.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Moore PA,
                                                                                                                                                                                                                                                                                                                                                                                                                         English.
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                                                    The polypeptide are also useful
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                                                                          can also be
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RESULT 13
AAB12121
ID AAB12
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                                                                                                                                                                                                                                                                   17-NOV-1998;
22-DEC-1998;
16-MAR-1999;
27-APR-1999;
 channels
          Secretory proteins play important roles in the proliferation control, differentiation induction, the material transport and the biophylaxis cells. Membrane proteins have important roles as signal receptors, in
                                                                                                 Proteins comprising hydrophobic regions, such as secretory and membrane proteins, useful in research and diagnostics and having various activities e.g. immunomodulatory, antiinflammatory, chemokinetic,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence
                                                               Claim 1;
                                                                                                                                                                                                                   (SAGA
                                                                                                                                                                                                                                                                                                                                                                                                            Homo
                                                                                                                                                                                                                                                                                                                                                                                                                                     autoimmune disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  02-FEB-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAB12121 standard;
                                                                                                                                                    WPI; 2000-387753/33.
N-PSDB; AAA60183, AAA60193
                                                                                                                                                                                                                                                           19-MAY-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human; secreted protein; membrane protein; hydrophobic
proliferation control; differentiation induction; mater
                                                                                                                                                                                                                                                                                                                                   17-NOV-1999;
                                                                                                                                                                                                                                                                                                                                                           25-MAY-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                          biophylaxis; signal receptor; ion channel; transporter; immunostimulant; immunosuppressant; haematopoiesis regulator; chemotactic; chemokinetic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  495
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                                                                                                                                                                                                                                                                                                                                                                                                            sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               RMLPVDEFLPIMFDQHPNEQYKA------HFWPRD-LVAFSAQPLLAA-PTHYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FFL--DRFAVL-----PPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYA 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY-----IISREAMR 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK 113
                                                                                                                                                                                                                   SAGAMI CHE
PROTEGENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Similarity
                                                               Page 184-186; 410pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       579
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          domain
                                                                                        thrombolytic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                 thrombolytic;
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transporters. The present
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99JP-0119299.
99JP-0138169.
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98JP-0364315.
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                                                                                                                                                                                                                      INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                  olytic; anti-inflammatory; tumour inhibition Alzheimer's disease; Parkinson's disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  entry)
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25.1%;
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                                                                                                                                                                                                                                 CENT
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Pred. No. 5.6
                                                               English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         clone HP02962 isolated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A
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 sequence is a human protein
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      95;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      material transport;
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RESULT :
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Best Local :
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Matches
                                                                                                                                                                                                                                                                                                                      Human; ovarian antigen; ovary; ovarian; breast; cancer; tumour; ovarian cancer; breast cancer; tumour; reproductive system disorder; infertility; pregnancy disorder; anovulation; polycystic ovary syndro pCOS; ovarian cyst; dysmenorrhoea; endocrine disorder; infection; inflammatory condition; immune disorder; blood disorder; cardiovascular disorder; respiratory disorder; neurological disorder; gastrointestinal disorder; urinary system disorder; drug screening; gene therapy; chromosome mapping; forensic analysis; antibody preparation; cytostatic; immunomodulatory; neuroprotective; antiinflammatory; gynaecological; reproductive.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  has at least one hydrophobic domain. This protein may be a secretory or a membrane protein. The present protein may have cytokine and cell proliferation/differentiation activity, immune stimulating or suppressing activity, haematopoiesis activity, tissue growth activity, activity, activity, chemotractic/chemokinetic activity, haemostatic activin/inhibin activity, chemotractic/chemokinetic activity, haemostatic
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       and thrombolytic activity, anti-inflammatory activity and tumour inhibition activity. The present protein could therefore be used treatment of autoimmune disease, Alzheimer's disease, Parkinson's
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ABP42016 standard;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         disease,
                                             N-PSDB; ABQ55093
                                                                                                                                                            07-JUN-2000; 2000US-209467P
                                                                                                                                                                                           07-JUN-2001; 2001WO-US18569
                                                                                                                                                                                                                                                           WO200200677-A1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human ovarian antigen HFKHF51,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      22-AUG-2002
                                                                                                                                                                                                                                                                                         Homo sapiens
                                                                                                                            (HUMA-) HUMAN GENOME
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                                                            2002-147878/19.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                -LSGVEKACEMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             VISLARRPDRRERMLASLWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           VISLASAAERRAHIADTFGSRGIPFQFFDA----LMPSERLEQAMAELVPGLSAHPY---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 RMLPVDEFLPIMFDQHPNEQYKA-----HFWPRD-LVAFSAQPLLAA-PTHYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 FFL--DRFAVL-----PPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DLIYLGRKQ-----VNPEKETAVEGLPGLVVAGYSYWTLAYALRLAGARKLLASQPLR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           and cancer.
                                                                                             Rosen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           595 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    (first entry)
                                                                                             CA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein; 636
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            9.0%;
                                                                                                                             SCI INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 129.5;
Pred. No. 5.8
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ID NO: 3148
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            . 8e
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DB 21;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             95;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           45;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 212
                                                                                                                                                                                                                                                                                                                                                                                                                                      syndrome;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             12;
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useful in the prevention,

molecules encoding novel ovarian polypeptides, ion, treatment and diagnosis of cancer (e.g.

Isolated nucleic acid

ovarian cancer), immune disorders, cardiovascular disorders and

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RESULT 15
AAB41900
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             recombinant vectors and host cells comprising human ovarian antigen polynucleotides, antibodies against human ovarian antigens, and the use of ovarian antigen polynucleotides and polypeptides in diagnosing, treating, prognosing or preventing various ovary and/or breast related disorders. Such conditions include ovarian cancer and breast cancer, and metastatic tumours of ovarian or breast origin, reproductive system disorders (e.g., infertility, disorders of pregnancy, anovulation, polycystic ovary syndrome, ovarian cysts, and dysmenornhoea), endocrine disorders, infections (e.g., chlamydia, HIV, toxoplasmosis, and toxic chlamydia, the content of the content 
                                                                                Human; open reading frame; ORFX; detection; cytostatic; hepatotropic; vulnerary; antipsoriatic; antiparkinsonian; nootropic; neuroprotective; anticonvulsant; osteopathic; antiarthritic; immunosuppressant; cardiant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The invention relates to 2175 novel human ovarian antigens (ABP41054-ABP43228) and to cDNAs encoding them (ABC54131-ABC56305), and also encompasses polypeptides 90% identical and polynucleotides 95% identical to the sequences of the invention. The invention additionally relates to
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               AAB41900 standard; Protein;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          neurological diseases
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hypotensive;
                                                         immunostimulant; thrombolytic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              483
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             536 RMLPVDEFLPIMFDQHPNEQYKA-----HFWPRD-LVAFSAQPLLAA-PTHYA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             424 TLTKGEVGCFLSHYSIWEEVVARGLARVLVFEDDVRFESNFRGRLERLMEDV-EAEKLSW 482
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  365 VISLARRPDRRERMLASIWEMEISGRVVDAVDGWMLNSSAIRNLGVDLLPGYQ-DPYSGR 423
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                itp.wipo.int/pub/published_pct_sequences.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      DSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGY-----IISREAMR 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     FFL--DRFAVL-----PPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYA 212
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ·LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLG---EGAEQFLAEDTWLEERFDK 113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DLIYLGRKQ----
                                                                                                                                                                                                                                                                                                                      ORFX ORF1664 polypeptide sequence SEQ ID NO:3328
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         59;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        636 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Conservative
dermatological;
                                                                                                                                                                                                                                                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            H
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        -VNPEKETAVEGLPGLVVAGYSYWTLAYALRLAGARKLLASQPLR
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          521
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A
                                                         vasotropic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Indels
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                                                         antidiabetic;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           636;
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ımmunosuppressive;

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В δã

244 MINLRRRQDRRERMLRALQAQEIECRLVEAVDGKAMNTSQVEALGIQMLPGY-RDPYHGR 302

5 VISLASAAERRAHIADTFGSRGIPFQFFDAL----MPSERLEQAMAELVPGLSAHPY---

Query Match Matches

Local

Similarity

8.8%;

Score 127; uc nred. No. 9e-05; nres 120;

Length 521; Indels

56;

15;

57

Conservative

45;

Sequence

521 AA;

Š В

110

RFDKDSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHC-GTAGYIISREAMRFFLD 168 PLTKGELGCFLSHYNIWKEVVDRGLQKSLVFEDDLRF----EIFFKRRLMNLMRDV-ERE -LSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQF------LAEDTWLEE 109 δÃ 밁 δõ Вþ δÃ 망

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immunostimulant; cardiant; thrombolytic; coagulant; vasotropic; antidiabetic; hypotensive; dermatological; immunosuppressive; antiinflammatory; antibacterial; antiviral; antifungal; antirheumatic; antithyroid; and antianaemic. The sequences can be used for determining the presence of or predisposition to, or preventing or treating pathological conditions associated with an ORFX-associated disorder. The
                                                                                                                                                                                                                                                                                                                                                                                           AAC74446 to AAC77606 encode the proteins given in AAB40237 to AAB43397, which represent the human ORFX open reading frames I to 3161. The ORFX sequences have activities such as: cytostatic; hepatotropic; vulnerary; antipsoriatic; antiparkinsonian; nootropic; neuroprotective; osteopathic; anticonvulsant; antiarthritic; immunosuppressant;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        antianaemic; gene therapy; cancer; proliferative disorder; hypertension; neurodegenerative disorder; osteoarthritis; graft vs host disease; cardiovascular disease; diabetes mellitus; hypothyroldism; SCID; AIDS; cholesterol ester storage; systemic lupus erythematosus; infection; severe combined immunodeficiency; malaria; autoimmune disorder; asthma; allergy; aplastic anaemia; nocturnal haemoglobinuria; burn; wound; bone damage; cartilage damage; antiinflammatory disease; coagulation;
                                                                                                                                             nucleic acids can be used to express ORFX proteins in gene therapy vectors. The proteins and nucleic acids may be used to treat cancers, proliferative disorders, neurodegenerative disorders, osteoarthritis, graft vs host disease, cardiovascular disease, diabetes mellitus, hypertension, hypothyroidism, cholesterol ester storage, systemic luph hypertension, hypothyroidism, cholesterol ester storage, systemic luph
                                                           allergies, aplastic anaemia, burns, wounds, bone and cartilage on nocturnal haemoglobinuria, antiinflammatory disease; to enhance
                                                                                                      erythematosus, severe combined immunodeficiency (SCID), AIDS, viral, bacterial or fungal infection, malaria, autoimmune disorders, asthma,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Novel nucleic acids and peptides derived from open reading useful for treating e.g. cancers, proliferative disorders, neurodegenerative disorders and cardiovascular disease -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              WPI; 2000-602362/57.
N-PSDB; AAC76109.
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30-MAR-2000;
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02-APR-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 11; Page 2519-2520; 5507pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Shimkets
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 31-MAR-2000; 2000WO-US08621.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        antiviral;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          (CURA-) CURAGEN CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                RA,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      antibacterial; antifungal; antirheumatic; antithyroid;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     2000US-0540763
                                         to inhibit thrombosis;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Leach
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              99US-0127607
99US-0127636
                                         and as a contraceptive.
                                                                                                                                                    systemic lupus
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                                                                                  damage,
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Result
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Title:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  OM protein -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Post-processing:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Maximum
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Minimum
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence:
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                                                                                                                                                                                                                                                                                                                           Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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US-08-683-458-8
US-08-683-458-8
US-08-683-458-8
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Sequence 3, Appli	Sequence 2, Appli	2	Sequence 2, Appli	Sequence 2, Appli	Sequence 2, Appli	Sequence 3, Appli	Sequence 4, Appli	4,	Sequence 8, Appli		Sequence 67, Appl	Patent No. 5210183	Sequence 4049, Ap	Sequence 2, Appli	Sequence 2, Appli	Sequence 2, Appli	Sequence 2, Appli

ALIGNMENTS

Sequence 6, Application US/08312387B Patent No. 5545553
GENERAL INFORMATION: ZIP: 07601 COMPUTER READABLE FORM: MEDIUM TYPE: Floppy NUMBER OF SEQUENCES: 1
CORRESPONDENCE ADDRESS: TITLE OF INVENTION: GLYCOSYLTRANSFERATITLE OF INVENTION: OLIGOSACCHARIDES, APPLICANT: COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS SOFTWARE: PatentIn Release #1.0, COUNTRY: U ZIP: 07601 STREET: 411 Hack CITY: Hackensack ADDRESSEE: New Jersey 411 Hackensack Avenue USA Gotschlich, Emil C. Klauber & Jackson Floppy disk GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS Version AND GENES ENCODING THEM #1.25 OF F

TELEFAX: 201 343-1684
TELEX: 133521
INFORMATION FOR SEQ ID NO:
SEQUENCE CHARACTERISTICS: NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPAX: 201 343-1684 TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein CLASSIFICATION: 435 ATTORNEY/AGENT INFORMATION: NAME: Jackson Esq., Davi APPLICATION NUMBER: US/08/312,387B FILING DATE: July 7, 1994 LENGTH: amino acids 600-1-095

CURRENT APPLICATION DATA:

Matches Query Match Local Similarity les 280; Conserv MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG 60 100.0%; ilarity 100.0%; Conservative 0 0; Score 1440; DB 1 Pred. No. 7e-155; Mismatches DB 1; 0; Indels Length 280; 0; Gaps

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                                                                                                                              Matches
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                                                                                                                                                                                                                                                                                              INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                       NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPAX: 201 343-1684
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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LENGTH: 280 amino acids
TYPE: amino acid
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APPLICATION NUMBER:
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING T
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CLASSIFICATION:
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Pred. No. 7e-155;
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INFORMATION FOR SEQ ID NO:
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COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/683,458
                                                                                                                                                                                                                                                                                                                                   SEQUENCE CHARACTERISTICS:
LENGTH: 280 amino acid
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CLASSIFICATION: 435
PRIOR APPLICATION DATA:
APPLICATION NUMBER: (
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MEDIUM TYPE: Floppy
COMPUTER: IBM PC com
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CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
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REFERENCE/DOCKET NUMBER: 600-1-095A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         FILING DATE: September CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                       TYPE:
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Pred. No. 7e-155;
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                                                                                                                                                                                                Matches 280;
                                                                                                                                                                                                                               Query Match
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INFORMATION FOR SEQ ID NO:
                                                                                                                                                                                                                                                                                                                                               SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                             REFERENCE/DOCKET NUMBER: 60
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEPAX: 201 343-1684
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FILING DATE: September 26,
CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
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PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatil
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
NUMBER OF SEQUENCES: 12
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                                                                                                                                                                                                                   Local Similarity
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STATE: New Jersey
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STREET: 4:
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                                                                                                                                                                                                                                                                                                                                LENGTH:
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VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120
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411 Hackensack Avenue
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Pred. No. 7e-155;
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Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                   TELEFAX: (212) 869-974
TELEX: 66141 PENNIE
INFORMATION FOR SEQ ID NO:
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TITLE OF INVENTION:
TITLE OF INVENTION:
TITLE OF INVENTION:
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COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE CHARACTERISTICS:
LENGTH: 280 amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    APPLICANT: JOHNSON, KARL F. APPLICANT: ROTH, STEPHEN
                                                                                                                                                                                                                                                                                                                            MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                 TELECOMMUNICATION INFORMATION: TELEPHONE: (212) 790-9090
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Laura A. Coruzzi
REGISTRATION NUMBER: 30,
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CORRESPONDENCE ADDRESS:
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                                                                                                                        TYPE: amino acid
TOPOLOGY: linear
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           APPLICATION NUMBER: US/0 FILING DATE: 07-JUN-1995
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 STATE: New YOU COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                STREET: 1155 A CITY: New York
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VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK
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VENTION: SACCHARIDE UNITS WITH A POLYGLYCOSYLTRANSFERASE,
VENTION: POLYGLYCOSYLTRANSFERASE AND GENE ENCODING A
VENTION: POLYGLYCOSYLTRANSFERASE
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Pred. No. 7e-155;
0; Mismatches 0;
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SEQUENCE DESCRIPTION: SEQ ID NO: US-09-333-412-6
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US-09-333-412-6
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Best Local Similarity
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INFORMATION FOR SEQ ID NO: 6:
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LENGTH: 280 amino acids
TYPE: amino acid
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TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
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MEDIUM TYPE: Floppy disk
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ADDRESSEE: Klauber & Jackson
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               VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
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                                              VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK
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                                                                                                              LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA
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APPLICATION NUMBER: US/09/333,412 FILING DATE: 15-Jun-1999 CLASSIFICATION: <Unknown>
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STATE: New Jersey
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742
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NAME: LAULA A. COTUZZÍ
REGIZTRATION UNIMBER: 30,742
REFERENCE/DOCKET NUMBER: 7188
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 790-9090
TELEPAX: (212) 869-9741/8864
TELEX: 66141 PENNIE
TELEX: 66141 PENNIE
INFORMATION FOR SEQ ID NO: 6:
SEQUENCE CHARACTERISTICS:
LENGTH: 280 amino acids
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Ve.
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/09/338,943
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CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: U:
FILING DATE:
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CORRESPONDENCE ADDRESS:
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STATE: New York
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ZIP: 10036-2711
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                       VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK
                                                                                        VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK 240
                                                                                                                                                                               LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
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                                                                   VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK
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                                                                                                                                                          LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA
6, Application US/09338943
5. 6379933
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1155 Avenue of the Americas
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BUCZALA, STEPHANIE L.
WEITHOD OF TRANSFERRING AT LEAST TWO
VENTION: METHOD OF TRANSFERRING AT LEAST TWO
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VENTION:
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GENERAL INFORMATION:

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TELEX: 133521
INFORMATION FOR SEO ID NO: 8:
SEQUENCE CHARACTERISTICS:
LENGTH: 279 amino acids
TYPE: amino acid
TOPOLOGY: linear
MOLECULE TYPE: protein
Sequence 8, Application US/08683426 Patent No. 5705367
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Best Local Similarity
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REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600
TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
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STATE: New Jersey
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RESULT 10
US-08-683-458-8
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Best Local Similarity 71.6%;
Matches 209; Conservative 2
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SEQUENCE CHARACTERISTICS:
LENGTH: 279 amino acids
TYPE: amino acid
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CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber &
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NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
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MEDIUM TYPE: Floppy disk
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THEM
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TELEFAX: 133521
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CLASSIFICATION: 536
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OPERATING SYSTEM: PC-DOS/MS-DOS
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STATE: New Jerse
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                                                                                                           ----RHRRSLKVMFDLKRALGKFGREKKKRMERORQAELEKVYGRRVILFK 280
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Sequence 8, Application US/08683458 Patent No. 5798233

GENERAL INFORMATION: APPLICANT: Gotsch

Gotschlich, Emil C

GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS

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TITLE OF INVENTION:

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RESULT 11
US-08-878-360-8
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                                                                                       Sequence 8, Application US/08878360 Patent No. 5945322
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           GENERAL INFORMATION:
APPLICANT: GOTSCHIICH, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
TITLE OF INVENTION: OLIGOSACCHARIDES, AND GENES ENCODING THE
NUMBER OF SEQUENCES: 12
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INFORMATION FOR SEQ ID NO: 8
SEQUENCE CHARACTERISTICS:
LENGTH: 279 amino acids
CORRESPONDENCE ADDRESS
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APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 1994
CLASSIFICATION: 435
AUTORNEY/AGENT INFORMATION:
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compati
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TELEFAX: 201 343-1684
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OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0, Version
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TYPE: amino acid TOPOLOGY: linear
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE:
CLASSIFICATION: 435
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REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095A
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                                                                                                                                                                                                                                                                                                      VDLMMFGNPDDREGMPVCQLNPALCAQELHYAKFHDQNSALGSLIEHDRRLNRKQQWRDS
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     72.0%; Score 1036.5; DB 1; 71.6%; Pred. No. 3.5e-109; 74. Mismatches 34;
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RESULT 12
US-09-333-412-8
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                                                                                Sequence 8, Application US/09333412
Patent No. 6342382
GENERAL INFORMATION:
GOTSCHICH, Emil C.
APPLICANT: GOTSCHICH, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Query Match
Best Local Similarity
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INFORMATION FOR SEQ ID NO:
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LENGTH: 279 amino acid
TYPE: amino acid
TOPOLOGY: linear
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                CLASSIFICATION: 435
ATTORNEY/AGENT INFORMATION:
NAME: Jackson Esq., Davi
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/878,360
FILING DATE: 18-JUN-1997
CLASSIFICATION: 435
CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                               181 VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGR-------
                                                                                                                                                                                                                                                                                                  241 PANTFKHR------LIRALTKIGREREKRRQRR-----EQLIGKIIVPFQ
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FILING DATE:
APPLICATION NUMBER: 08/312,387
FILING DATE: September 26, 199
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       61 VEKACFMSHAVLWEQALDEGVPYIAVFEDDVLLGEGAEQFLAEDTWLQERFDPDSAFVVR 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095B
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COUNTRY:
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STATE: New Jersey
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STREET: 411 Hackensack Avenue
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CORRESPONDENCE ADDRESS:
ADDRESSEE: Klauber & Jackson
                                            NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
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                                                                    OLIGOSACCHARIDES,
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Pred. No. 3.5
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                                                                    GENES ENCODING
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US-08-646-590B-40
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                                                                                                                                                                              Sequence 40, Application US/08646590B Patent No. 5962283 GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
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                                                       CORRESPONDENCE ADDRESS:
ADDRESSEE: Fish & Richardson, P.C
                                                                                                                  APPLICANT: Warren, Patrick V.
APPLICANT: Swanson, Ronald V.
TITLE OF INVENTION: TRANSAMINASES AND AMINOTRANSFERASES
                                                                                                 NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                        181
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                                                                                                                                                                                                                                                                                                                                             234 ----RHRRSLKVMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK
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                                                                                                                                                                                                                                                                                                                        241 PANTFKHR------LIRALTKIGREREKRRORR-----EQLIGKIIVPFO
                                                                                                                                                                                                                                                                                                                                                                                                                                          181 VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGR-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        61 VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120
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                                    STREET:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
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FILING DATE: 15-Jun-1999
CLASSIFICATION: <UNknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: protein SEQUENCE DESCRIPTION: SEQ ID NO: 8:
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La Jolla
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TYPE: amino acid
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TELEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 APPLICATION NUMBER: 08/312,387 FILING DATE: July 7, 1994
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PatentIn Release #1.0,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      COMPUTER: IBM PC compatible
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIUM TYPE: Floppy disk
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                                      4225 Executive Square, Suite 1400
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71.6%; Pred. No. 3.5e-109;
tive 24; Mismatches 34;
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Best Local Similarity
"hes 75; Conserve
                                                                                                                                                 RESULT 14
US-09-412-184-40
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                                                                                       Sequence 40, Application US/09412184 Patent No. 6268188 GENERAL INFORMATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MOLECULE TYPE: protein FRAGMENT TYPE: internal
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LENGTH: 394 amino acids
TYPE: amino acid
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REFERENCE/DOCKET NUMBER: 091
TELECOMMUNICATION INFORMATION:
TELEPHONE: 619/678-5070
               APPLICANT: Warren, Patrick V.
APPLICANT: Swanson, Ronald V.
TITLE OF INVENTION: TRANSAMINASES AND AMINOTRANSFERASES
NUMBER OF SEQUENCES: 42
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ATTORNEY/AGENT INFORMATION:
NAME: Haile, Ph.D., Lisa
REGISTRATION NUMBER: 38,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/599,171
FILING DATE: 09-FEB-1996
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SOFTWARE: FastSEQ for Windows Version
CURRENT APPLICATION DATA:
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CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                    139
                                                                                                                                                                                                                          292 FVNEMRNAFERRRDTAVEELSKIPGMDVV
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CLASSIFICATION:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICATION NUMBER: US/08/646,590B FILING DATE: 08-May-1996
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                                                                                                                                                                                                                                                                FGREKKKRMERQRQA---ELEKVYGRRVI 277
                                                                                                                                                                                                                                                                                                                                      GMPVYQVSPALCTQELHYAKFL-SQNSMLGSDLEKDREQGRRHRRSLKVMFDLKRALGK- 251
                                                                                                                                                                                                                                                                                                                                                                                                                                                         EQIRFFGGVP-----VEVPLKKEKGFQLSLEDVKEKVTERTKAIVINSPNNPTGAVY 182
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             DDVLLGEGAEQFLAEDTWLEERFDKDSAFIVRLETMFAKVIVRPDK-VLN------Y 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LLKENKVEYKPSEIVVS-----AGAKMVLFL----IFMAILDEGDEVLLPSPYWYTYP 130
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                                                                                                                                                                                                                                                                                                      SMTGWRIGYVACPEE--YAKVIASLNSQSVSNVTTFAQYG-----ALEALKNPKSKD 291
                                                                                                                                                                                                                                                                                                                                                                              EEEELKKI-AEFCVERGIFIISDECYEYFVYGDAKFVSPASFSDEVKNITFTVNAFSKSY 241
                                                                                                                                                                                                                                                                                                                                                                                                                  ENRSFPLLESEHCGTAG-YIISREAMRFFL--DRFAVLPPERIKAVDLMMFTY--FFDKE 193
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92037
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22.8%;
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Pred. No. 0.
                                                                                                                                                                                                                            320
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RESULT 15
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Best Local Similarity
"~+~hes 75; Conserv
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; FRAGMENT TYPE:
US-09-412-184-40
Sequence 17, Application US/08468576B Patent No. 5955345
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                TELEFAX: 619/678-5099
INFORMATION FOR SEQ ID NO: 40:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ATTORNEY/AGENT INFORMATION:
NAME: Haile, ph.D., Lisa A.
REGISTRATION NUMBER: 38,347
REFERENCE/DOCKET NUMBER: 099
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         COMPUTER: IBM Compatible
OPERATING SYSTEM: Windows95
SOFTWARE: Fast-SEQ for Windows Version
CURRENT APPLICATION DATA:
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APPLICATION NUMBER: PCT/US97/01094
FILING DATE: 21-January-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     COMPUTER READABLE FORM:
MEDIUM TYPE: Diskette
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                                                                                                                       292
                                                                                                                                                            252 FGREKKKRMERQRQA---ELEKVYGRRVI 277
                                                                                                                                                                                                                                       194 GMPVYQVSPALCTQELHYAKFL-SQNSMLGSDLEKDREQGRRHRRSLKVMFDLKRALGK- 251
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APPLICATION NUMBER: 08/599,171
                                                                                                                                                                                                                                                                                                                                                                                                      89
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     22 AKAKELRAKGYDVIGFGAGEPDFDTPDFIKEACIRALREGKTKYAPSAGIPELREAIAEK 81
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STREET: 4225 Executive Square, Suite 1400
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                                                                                                                       FVNEMRNAFERRRDTAVEELSKIPGMDVV 320
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               ASAAERRAHIADTFG-----FQFFDA 34
                                                                                                                                                                                                  SMTGWRIGYVACPEE--YAKVIASLNSQSVSNVTTFAQYG----
                                                                                                                                                                                                                                                                                                                     ENRSFPLLESEHCGTAG-YIISREAMRFFL--DRFAVLPPERIKAVDLMMFTY--FFDKE 193
                                                                                                                                                                                                                                                                                                                                                               EQIRFFGGVP------VEVPLKKEKGFQLSLEDVKEKVTERTKAIVINSPNNPTGAVY 182
                                                                                                                                                                                                                                                                                                                                                                                                                                           LLKENKVEYKPSEIVVS-----AGAKMVLFL----IFMAILDEGDEVLLPSPYWVTYP 130
                                                                                                                                                                                                                                                                                EEEELKKI-AEFCVERGIFIISDECYEYFVYGDAKFVSPASFSDEVKNITFTVNAFSKSY 241
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19/678-5099
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Best Local
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INFORMATION FOR SEQ ID NO:
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APPLICATION UMBER: US/0
FILING DATE: 06-UUN-1995
CLASSIFICATION: 435
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TELEPHONE: (914) 332-1700
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       FILING DATE: 17-FEB-1989 ATTORNEY/AGENT INFORMATION:
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APPLICATION NUMBER: US 07/312,543
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APPLICATION NUMBER: US 0:
FILING DATE: 04-DEC-1989
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PRIOR APPLICATION DATA:
APPLICATION NUMBER: 1
FILING DATE: 08-JUN-
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APPLICATION NUMBER: US 08/239,276
FILING DATE: 05-MAY-1994
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MEDIUM TYPE: Diskette, 3.50 inch, 1.4 Mb storage
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   PRIOR APPLICATION DATA:
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                                   203 ALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLKVMF--DLKRALGKFG-----RE 255
                                                                            158 NMETQTSSTFNRDSLAEKLQLIDDQFADAYPQRIKFESLEIKLNVYKREIE----EQLRA 213
                                                                                                                                                           102
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nes 66; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           REFERENCE/DOCKET NUMBER: 33
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ZIP: 10591-5144
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                                                                                                                                                                                                                                                                                                                                                           5 VISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG---- 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           CENGTH:
                                                                                                                                                                                                                                                                               ----VEKACFM---SHAVLWEQALDEGLPY-IAVFEDDVLLGEGAEQFLAEDTWLEERFD 112
                                                                                                                                                           KEKVFTMQDLLQLIKINPTSSLYKSLVSGSDK----ENQKGFLMHFLKELAEYHQAKESC 157
                                                                                                                                                                                              KDSAFIVR------LETMFAKVIVRPDKVLNYENRSFPL---------- 145
                                                                                                                                                                                                                                         RSISVEGSSLLIGASNSLVADHLQRCGYEYSLSVF------
                                                                                                                                                                                                                                                                                                                      VADVLSQDELRKKLYQTFKDRGI----LDTLKTQLR-NQLIHELM-----HPVLSGELQP 59
                                                                                                                 -LESEHCGTAGYIISREAMRFFLDRFAVLPPERIK--AVDLMMFTYFFDKEGMPVYQVSP 202
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      : 712 amino acids amino acid
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---DTEIAKIKMEAKKKYEKELTMFQNDFEKACQAKSEALVLRE 264
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Qy 256 KK--KRMERQRQAELEKVYGRRVILFK 280
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Db 265 KSTLERIHKHQEIETKEIYAQRQLLLK 291

Search completed: December 2, 2002, 12:03:18
Job time: 13.4223 secs

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Title:
Perfect score:
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Maximum DB
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1: /cgn2_6/ptodata/1/pubpaa/v.

2: /cgn2_6/ptodata/1/pubpaa/v.

3: /cgn2_6/ptodata/1/pubpaa/v.

4: /cgn2_6/ptodata/1/pubpaa/v.

5: /cgn2_6/ptodata/1/pubpaa/v.

6: /cgn2_6/ptodata/1/pubpaa/v.

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10: /cgn2_6/ptodata/1/pubpaa/v.

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        Maximum Match 100%
Listing first 45 summaries
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// cgn2_6/ptodata/1/pubpaa/US06_NEW_PUB.pep: *
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// cgn2_6/ptodata/1/pubpaa/US06_PUBCOMB.pep: *
// cgn2_6/ptodata/1/pubpaa/US07_NEW_PUB.pep: *
// cgn2_6/ptodata/1/pubpaa/US07_PUBCOMB.pep: *
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// cgn2_6/ptodata/1/pubpaa/US00_NEW_PUB.pep: *
// cgn2_6/ptodata/1/pubpaa/US60_NEW_PUB.pep: *
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10 US-09-849-031A-1
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Sequence 1, Appli
Sequence 222, App
Sequence 214, Appl
Sequence 72, Appl
Sequence 174, Appl
Sequence 11489, A
Sequence 174, App
Sequence 1335, App
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                                                                                                                                                                                                             Sequence 6, Appli
Sequence 8, Appli
Sequence 2, Appli
Sequence 40, Appl
Sequence 5280, Ap
Sequence 12140, A
Sequence 11519, A
Sequence 11310, A
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Sequence 48086, A
Sequence 1, Appli
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4.9	4.9	4.9	4.9	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.2
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us-09-916-790-5	US-09-764-367A-4	US-09-815-242-10895	US-09-844-006A-2	US-09-815-242-13684	US-09-817-764-4	US-09-864-761-33635	US-09-801-368-306	US-09-815-242-13689	US-09-925-300-1620	US-09-902-941-1906	US-09-801-368-368	US-09-841-132-592	US-09-903-012-32	US-09-887-586A-32	US-09-737-149-2	US-09-815-242-12656	US-09-815-242-5389	US-09-874-923-96	US-09-991-496-96	US-09-874-923-97	US-09-991-496-97	US-09-815-242-13382	US-09-815-242-12608	US-09-815-242-5371	US-09-815-242-4897
Sequence 5, Appli	Sequence 4, Appli	Sequence 10895, A	Sequence 2, Appli	136	Sequence 4, Appli	Sequence 33635, A	Sequence 306, App	13689,	Sequence 1620, Ap	1906,	•	592,	32,	Sequence 32, Appl	Sequence 2, Appli	12	Sequence 5389, Ap	Sequence 96, Appl	Sequence 96, Appl		Sequence 97, Appl	Sequence 13382, A	Sequence 12608, A	5371,	Sequence 4897, Ap

ALIGNMENTS

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RESULT 1
US-10-007-267-6
(Sequence 6, Application US/10007267)
Patent No. US20020127682A1
GENERAL INFORMATION:
                                                    INFORMATION FOR SEQ ID NO: 6: SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             COMPUTER READABLE FORM:

COMPUTER READABLE FORM:

MEDIUM TYPE: Floppy disk

COMPUTER: IBM PC compatible

CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                    PRIOR APPLICATION DATA:
APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-10n-1999
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
ATTORNEY/AGENT INFORMATION:
                                                                                                                                   TELECOMMUNICATION INFORMATION:
TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
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TITLE OF INVENTION: GLYCOSYLTRANSFERASES FOR BIOSYNTHESIS OF
OLIGOSACCHARIDES, AND GENES ENCODING THEM
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICATION NUMBER: US/10/007,267 FILING DATE: 03-Dec-2001 CLASSIFICATION: <Unknown>
                                                                                                                                                                                                                     NAME: Jackson Esq., David A. REGISTRATION NUMBER: 26,742 REFERENCE/DOCKET NUMBER: 600-1-095
TYPE: amino acid
                                                                                                            TELEX: 133521
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                COUNTRY: USA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STREET: 411 Hackensack Avenue
                          LENGTH: 280 amino acids
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 8, Application US/10007267 Patent No. US20020127682A1 GENERAL INFORMATION:
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                                INFORMATION FOR SEQ ID NO: 8: SEQUENCE CHARACTERISTICS:
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                                                                                                                NAME: Jackson Esq., David A.
REGISTRATION NUMBER: 26,742
REFERENCE/DOCKET NUMBER: 600-1-095
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                 APPLICATION NUMBER: US/10/007,267
FILING DATE: 03-Dec-2001
CLASSIFICATION: -Unknown>
PRIOR APPLICATION DATA:
                                                                                                                                                                                  ATTORNEY/AGENT INFORMATION:
                                                                                                                                                                                                                                                                                                                                     SOFTWARE: PatentIn Release #1.0, Version #1.25 CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                 COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICANT: Gotschlich, Emil C.
TITLE OF INVENTION: GLYCOSYLTRANSFERASES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        NUMBER OF SEQUENCES:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK 240
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                                                                                                                                                                                               APPLICATION NUMBER: US/09/333,412
FILING DATE: 15-Jun-199
APPLICATION NUMBER: 08/312,387
FILING DATE: July 7, 1994
                                                                               TELEPHONE: 201 487-5800
TELEFAX: 201 343-1684
                                                                                                                                                                                                                                                                                                                                                                    COMPUTER: IBM PC compatible OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      STATE: New Jersey
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                                                                 TELEX: 133521
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               LENGTH: 279 amino acids
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   amino acid
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; ORGANISM: Neisseria meningitidis US-09-211-691-2
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LENGTH: 275
TYPE: PRT
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APPLICANT: Wakarchuk, Warren W.
APPLICANT: Wakarchuk, Warren W.
APPLICANT: National Research Council of Canada
TITLE OF INVENTION: Fusion Proteins for Use in
TITLE OF INVENTION: Oligosaccharides
FILE REFERENCE: 019957-012910US
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOR FILING DATE: 1
NUMBER OF SEQ ID NOS:
SOFTWARE: Patentin V
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Gilbert, Michel APPLICANT: Young, N. Marti
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION NUMBER: US/09/211,691
CURRENT FILING DATE: 1998-12-14
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                   VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKD----REQGRRHR
                                                                                                                      LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
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VDLMMFSDFFDREGMPVCQLNPALCAQELHYAKFHDQNSALGSLIEHDRLLNRKQQRRDS
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Best Local Similarity
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US-09-815-242-5280
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US-09-905-173-40
Sequence 5280, Application US/09815242 Patent No. US20020061569A1
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SOFTWARE: PatentIn version 3.0
SEQ ID NO 40
LENGTH: 394
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CURRENT FILING DATE: 2001-07-12
PRIOR APPLICATION NUMBER: US 09/412,184
PRIOR FILING DATE: 1999-10-04
PRIOR APPLICATION NUMBER: US 09/389,537
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PRIOR APPLICATION NUMBER: US 08/599,171
PRIOR FILING DATE: 1996-02-09
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APPLICANT: SWANSON, Ronald V.
APPLICANT: MATHUR, EIC J.
APPLICANT: MATHUR, EIC J.
TITLE OF INVENTION: ENZYMES HAVING TRANSAMINASE AND AMINOTRANSFERASE ACTIVITY AND METTITLE OF INVENTION: USE THEREOF
FILE REFERENCE: DIVER1240-7
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PRIOR APPLICATION NUMBER: US 09/481,733
PRIOR FILING DATE: 2000-01-11
PRIOR APPLICATION NUMBER: US 09/069,226
PRIOR FILING DATE: 1998-04-27
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PRIOR APPLICATION NUMBER: US 08/646,590
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                                                                                                                                                                       FGREKKKRMERQRQA---ELEKVYGRRVI 277
                                                                                                                                                                                                                 SMTGWRIGYVACPEE--YAKVIASLNSQSVSNVTTFAQYG---
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22.8%;
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CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-10-23
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
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SOFTWARE: FastSEQ for
SEQ ID NO 5280
LENGTH: 657
                                                                                                                                                                                                                                                        Sequence 12140, Application US/09815242 Patent No. US20020061569A1
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APPLICANT: Xu, H. Howard TITLE OF INVENTION: Identification TITLE OF INVENTION: Prokaryotes FILE REFERENCE: ELITRA.011A
                                                                                                                                                                                         APPLICANT: Haselbeck, Robert APPLICANT: Ohlsen, Kari L.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRIOR FILING DATE: 2000-12-22
PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
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                                                                                                                                                                       APPLICANT:
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mes 54; Conserv
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Zyskind, Judith W.
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                                                                                  Carr, Grant J.
Yamamoto, Robert T.
                                                                                                                            Wall, Daniel
Trawick, John D.
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                                                                                FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
PRIOR APPLICATION NUMBER: 60/191,078
PRIOR FILING DATE: 2000-03-21
PRIOR APPLICATION NUMBER: 60/206,848
PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
PRIOR FILING DATE: 2000-05-26
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Sequence 11519, Application US/09815242 Patent No. US20020061569A1
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PRIOR FILING DATE: 2000-05-23
PRIOR APPLICATION NUMBER: 60/207,727
                                                                                                                                                                                                                                                                                       APPLICANT: Xu, H. Howard
TITLE OF INVENTION: Identification of Essential Genes
TITLE OF INVENTION: Prokaryotes
                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT:
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICANT: Haselbeck, Robert
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SOFTWARE: FastSEQ for Windows Version 4.0
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PRIOR FILING DATE: 2000-03-21
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APPLICATION NUMBER: 60/253,625
FILING DATE: 2000-11-27
APPLICATION NUMBER: 60/257,931
FILING DATE: 2000-12-22
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                                     APPLICATION NUMBER: 60/242,578 FILING DATE: 2000-10-23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   SFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKAVDLMMFTYFFDKEGM 195
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Zyskind, Judith W.
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DATE:
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US-09-815-242-11519
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US-09-815-242-11310
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PRIOR FILLING DATE: 2000-03-21
PRIOR PELICATION NUMBER: 60/206,848
PRIOR FILLING DATE: 2000-05-23
PRIOR PELICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR APPLICATION NUMBER: 60/257,931
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PRIOR APPLICATION NUMBER: 60/269,308
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Best Local :
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LENGTH: 762
                                                                                    SEQ ID NO 11310
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                                                                                                                                                                                                                                                                                                                                                                                                                                                         TITLE OF INVENTION: Identification of Essential Genes TITLE OF INVENTION: Prokaryotes FILE REFERENCE: ELITRA.011A CURRENT APPLICATION NUMBER: US/09/815,242 CURRENT FILING DATE: 2001-03-21
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PRIOR FILING DATE: 2000-12-2
PRIOR APPLICATION NUMBER: 60/269,308
PRIOR FILING DATE: 2001-02-16
                                                                                                        SOFTWARE: FastSEQ
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                                                                                                                             NUMBER OF SEQ ID NOS: 14110
                                                                                                                                                   PRIOR FILING DATE: 2001-02-16
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               ORGANISM: Helicobacter pylori
                                        TYPE:
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Xu, H. Howard
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RESULT 9
US-10-017-216-4
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RESULT 10
US-09-864-761-48086
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SEQ ID NO 4
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TITLE OF INVENTION: 13245, A No. US20020160483A1el Human Myotonic Dystrophy Type Prot
TITLE OF INVENTION: Kinase and Uses Therefor
FILE REFERENCE: 10147-57U1
CURRENT APPLICATION NUMBER: US/10/017,216
CURRENT FILING DATE: 2001-10-23
PRIOR APPLICATION NUMBER: US 60/242,429
PRIOR APPLICATION NUMBER: US 60/242,429
PRIOR FILING DATE: 2000-10-23
PRIOR FILING DATE: 2000-10-23
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         LENGTH: 2055
TYPE: PRT
ORGANISM: Mus musculus
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Local Similarity 17.1%;
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                                                                                                                                                      ---TYFFDKE----GMPVYQVSPALCTQELHYAKFLSQNSMLGSD-----LEKDR 229
                                                                                                                                                                                                                                                                                                                                                                       FQFF-----DALMPSERLEQAMAEL------VPGLSAHPYLSGVEKACFMSHAVLWEQ 75
                                                                  EQARMEVSQEDDKALQLLHDIREQ----SRKLQEIKEQEYQAQVEEM
                                                                                                  EQGR----RHRRSLKVMFDLKRALGKFGREKKKRMERQRQAELEKV 271
                                                                                                                                                                                                  LAFSGEELPFVGFSYSKALGYLGRSESVVSSLD----SPAKVSSMEKKLLIKSKELQDS
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21.7%;
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Pred. No. 21;
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 140 VLSKEALKRFVDAF 153
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; OTHER INFORMATION: E OTHER INFORMATION: E OTHER INFORMATION: S OTHER INFORMATION: E OTHER INFORMATION: US-09-864-761-48086
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PRIOR APPLICATION NUMBER: US 09/632,366
PRIOR FILING DATE: 2000-08-03
PRIOR APPLICATION NUMBER: GB 24263.6
PRIOR FILING DATE: 2000-10-04
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CURRENT APPLICATION NUMBER: US/09/864,761
CURRENT FILING DATE: 2001-05-23
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TITLE OF INVENTION: HUMAN GENOME-DERIVED SINGLE EXON NUCLEIC ACID PROBES USEFUL
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PRIOR FILING DATE: 2001-01-30
PRIOR APPLICATION NUMBER: PCT/US01/00665
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PRIOR FILING DATE: 2000-02-04
PRIOR APPLICATION NUMBER: US 60/207,456
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NUMBER OF SEQ ID NOS: 49117
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PRIOR FILING DATE: 2000-06-30
PRIOR APPLICATION NUMBER: US 09/774,203
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PRIOR APPLICATION NUMBER: PCT/US01/00668
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PRIOR FILING DATE: 2001-01-30
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APPLICATION NUMBER: PCT/US01/00663
FILING DATE: 2001-01-30
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IISREAMRFFLDRF 170
                                                                                                EHYLEDADWFLKADDDTYVILDNLRWLLSK--YDPEEPIYFGRRFKPYVKQGYMSGGAGY 139
                                                                                                                                                                                            EQFLAEDTWLEERFDKDSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEH-CGTAGY 156
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EXPRESSED IN PLACENTA, SIGNAL = 1.5
SWISSPROT HIT: 050950, EVALUE 4.90e-01
EST_HUMAN HIT: BE336820.1, EVALUE 1.00e-112
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Pred. No. 1
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                     US-09-815-242-13499
                                           RESULT 13
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US-09-849-562A-1
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LENGTH: 363
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Sequence 13499, Application US/09815242
                                                                                                                                                                                                                                                                                                                                                                                                                       NUMBER OF SEQ ID NOS: 40
SOFTWARE: PatentIn version 3.1
SEQ ID NO 1
LENGTH: 363
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Best Local Similarity
Matches 19; Conserv
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               APPLICANT: Cummings, Richard D.
APPLICANT: McEver, Rodger P.
TITLE OF INVENTION: Synthetic glycosulfopeptides and methods of synthesis thereof
FILE REFERENCE: 5820.594
FILE REFERENCE: 5820.594
CURRENT APPLICATION NUMBER: US/09/849,562A
CURRENT FILING DATE: 2001-05-04
PRIOR APPLICATION NUMBER: 09/334,013
PRIOR FILING DATE: 1999-06-15
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APPLICANT: McEver, Rodger P.
TITLE OF INVENTION: synthetic glycosulfopeptides
FILE REFERENCE: 5820.593
                                                                                                                                               157 IISREAMRFFLDRF 170
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                                                                                                          214 VLSKEALKRFVDAF 227
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                                                                                                                                                                                                                                EQFLAEDTWLEERFDKDSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEH-CGTAGY 156
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                                                                                                                                                                                                                                                                              Conservative
                                                                                                                                                                                                                                                                                               5.4%; Score 77.5;
25.7%; Pred. No. 2
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2.8;
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APPLICANT:
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US-09-815-242-13499
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PRIOR FILING DATE: 2000-05-23
PRIOR PELICATION NUMBER: 60/207,727
PRIOR APPLICATION NUMBER: 60/207,727
PRIOR FILING DATE: 2000-05-26
PRIOR PELICATION NUMBER: 60/242,578
PRIOR APPLICATION NUMBER: 60/243,525
PRIOR APPLICATION NUMBER: 60/253,625
PRIOR FILING DATE: 2000-11-27
PRIOR FILING DATE: 2000-11-27
PRIOR APPLICATION NUMBER: 60/257,931
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2000-12-22
PRIOR FILING DATE: 2001-02-16
PRIOR FILING DATE: 2001-02-16
PRIOR FILING DATE: 2001-02-16
                                                                                                                                                                                               Sequence 222, Application US/09801368
Patent No. US20020128250A1
GENERAL INFORMATION:
APPLICANT: Busby, Robert
APPLICANT: Cali, Brian
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SEQ ID NO 13499
LENGTH: 623
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TITLE OF INVENTION: Identification of Ess
TITLE OF INVENTION: Prokaryotes
FILE REFERENCE: ELITRA.011A
CURRENT APPLICATION NUMBER: US/09/815,242
CURRENT FILING DATE: 2001-03-21
                                                                                                                                                                             APPLICANT:
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SOFTWARE: FastSEQ for Windows Version
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ORGANISM: Streptococcus pneumoniae
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      115 SAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLP 174
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          389 EGLDESKRVINYLQEVAEEVKTSGGSTTSIAE----LLEQFLFPRSTHGTLIEKLSGGEKK 445
                                                                                                                                                                                                                                                                                                                                                                                                                                       544 -----KVVKV------REDKKRMTYQEKQEWASIEG 568
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    175 PERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSM---LGSDLEKDREQ 231
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Match 5.4%; Score 77.5; D
Local Similarity 19.8%; Pred. No. 5.9;
Local Similarity 42; Mismatches
                                                                                                                      Hecht, Peter
Holtzman, Doug
Madden, Kevin
                  Maxon, Mary
Milne, Todd
No. US20020128250Alman, Thea
Royer, John
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Trawick, John D.
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Salama, Sofie
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US-09-976-059-14
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity 18.6
                                                                                                                                                                                     Query Match
Best Local :
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       GENERAL INFORMATION:
APPLICANT: Farnet, Chris
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: PatentIn version 3.0 SEQ ID NO 222
                                                                                                                                                                  Matches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      APPLICANT: Summers, Eric
TITLE OF INVENTION: Methods for Improving Secondary Metabolite Production in Fungi
EILE REFERENCE: 109272.147
CURRENT APPLICATION NUMBER: US/09/801,368
CURRENT FILING DATE: 2001-03-07
CURRENT FILING DATE: 2001-03-07
                                                                                                                                                                                                                                                                                                                                                                CURRENT APPLICATION NUMBER: US/09/976,059
CURRENT FILING DATE: 2001-10-15
NUMBER OF SEQ ID NOS: 34
                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Zazopoulos, Emmanuel
APPLICANT: Staffa, Alfredo
TITLE OF INVENTION: Genes and Proteins for Biosynthesis of Ramoplanin
FILE REFERENCE: 3019-PCT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRIOR APPLICATION NUMBER: US 09/487,558
PRIOR FILING DATE: 2000-01-19
PRIOR APPLICATION NUMBER: US 60/160,587
PRIOR FILING DATE: 1999-10-20
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TYPE: PRT
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2950 EVYVAGRQ----LARAYLGRAALTGTRFVACPFLPAGERMYRTGDRARWSRGRLQFAGRT 3005
                                                                             2896 LVNMYGITETTVHVTHQDLAPADTTGSPIGRGIPG-----LSVYVLDEALRPVPPGVAG 2949
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          123 TMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIIS--REAMRFFLDRFAVLPPERIKA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      634 I-----YPDLESV-IARIMPNLSYHEKISFKSFLLIIVLKSSLDMKEER 676
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           181 VDLMMFTYFFDKEGMPVYQVSPALCTQE-LHYAKFLSQNSMLGS-DLEKDR 229
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              521 WKIWYPTGDDYDEKLDSILQKLEILSNQLIALN-----LREPLLLKKQIQNFALFLTMLK 575
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               479 YFSSPFGQQVLSSTFLD----HKLE---
                                     55 HPYLSGVEKACFMSHAVLWEQALD----EGLPYIAVFE-----DDVLLGEGAEQFLAE- 103
                                                                                                                                                                                 Local
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                                                                                                                    5 VISLASAAERRAHI------ADTFGS---RGIPFQFFDALMPSERLEQAMAELVPGLSA 54
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Similarity 21.8%;
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Silva, Jeff
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Pred. No. 96;
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Pred. No. 15;
47; Mismatches
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Search completed: December 2, 2002, 12:16:05 Job time: 8.61203 secs

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Minimum
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Maximum Match 100%
Listing first 45 summaries
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5.9	5.9	5.9	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6. ₂	6.2
1529	1502	653	291	2970	468	662	429	314	998	292	2415	885	256	594	266
N	N	N	N	N	Ľ	N	N	N	Ŋ	N	Н	1	N	N	N
A59310	T14278	AB1128	AB1384	T08839	D26190	G89909	A36220	G71974	S47105	D71894	A33733	VCPVF2	T00097	149127	н97576
unconventional myo	myosin-like protei	transcription anti	conserved hypothet	polyprotein - marm	phosphogluconate d	transketolase [imp	transforming prote	probable keto-acid	myosin heavy chain	probable lipopolys	spectrin alpha cha	structural protein	hypothetical prote	intracellular prot	hypothetical prote

ALIGNMENT

A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, A;Title: Complete genome sequence of Neisseria meningitidis serogra; Reference number: A81000; MUID:20175755; PMID:10710307 A;Accession: A81027 R;Tettelin, H.; Saunders, N.J.; Heidelberg, J.; Jeffries, A.C.; Nelson, Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; ri, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Science 287, 1809-1815, 2000
A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Ωy DЬ 밁 В Qγ Qy В QΥ A;Gene: NMB1926 C;Superfamily: lipopolysaccharide biosynthesis-associated protein A; Cross-references: GB: AE002541;
A; Experimental source: serogroup A;Status: preliminary A;Molecule type: DNA A;Residues: 1-280 <TET> C;Species: Neisseria meningitidis
C;Date: 31-Mar-2000 #sequence_revision
C;Accession: A81027 lacto-N-neotetraose biosynthesis glycosyl transferase LgtE NMB1926 [imported] -Best Loc Matches Query Match 181 181 121 121 61 61 Local 1 MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG 60 VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280 LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180 VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120 VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK 240 VDWMMFTYFFDKEGMPVYQVNPALCTQELHYAKFLSKNSMLGSDLEKDREQERRHRRSLK VMFDLKRALGKFGREKKKRMERQRQAELEKAYGRRVISFK al Similarity 253; Conserv Conservative 89.2%; 9; GB:AE002098; NID:g7227175; PIDN:AAF42255.1; PID:g722 B, strain MC58 Score 1284; D Pred. No. 3.3e 9; Mismatches 31-Mar-2000 #text_change 19-Jan-2001 3.3e-104; DB 2; Length 280; Moxon, E.R.; serogroup B 0 Gaps 240 Rappuoli, R.; strain MC58. Dougherty, Pizza, M. K.田.; 0, Neise

RESULT 2 \$70815 91ycosyl transferase E (EC 2.4.-.-) C;Species: Neisseria meningitidis

Neisseria meningitidis

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C;Date: 12-Feb-1998 #sequence_revision 20-Feb-1998 #text_change 20-Sep-1999 C;Accession: $70815
R;Jennings, M.P.; Hood, D.W.; Peak, I.R.A.; Virji, M.; Moxon, E.R.
Mol. Microbiol. 18, 729-740, 1995
A;Title: Molecular analysis of a locus for the biosynthesis and phase-variable & A;Reference number: $70812; MUID:96414473; PMID:8817494
A;Accession: $70815
A;Status: preliminary; nucleic acid sequence not shown
A;Molecule type: DNA
A;Residues: 1-276 <ZIEN>
A;Cross-references: EMBL:U25839; NID:9973183; PIDN:AAC44086.1; PID:9973187
C;Genetics:
A;Gene: lgtE
C;Superfamily: lipopolysaccharide biosynthesis-associated protein
C;Reywords: glycosyltransferase
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Hickey, E.K.; Haft, D.H.; Salzberg, S.L.; White, O.; Fleischmann, R.D.; Dougherty
ri, H.; Qin, H.; Vamathevan, J.; Gill, J.; Scarlato, V.; Masignani, V.; Pizza, M.
Science 287, 1809-1815, 2000
A;Authors: Grandi, G.; Sun, L.; Smith, H.O.; Fraser, C.M.; Moxon, E.R.; Rappuoli,
A;Title: Complete genome sequence of Neisseria meningitidis serogroup B strain MC
A;Reference number: A81000; MUID:20175755; PMID:10710307
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A; Residues: 1-275 <TET>
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87.9%;
                                                                                                                                                  70.3%; Score 1012; DB 2; 75.1%; Pred. No. 1.5e-80; tive 20; Mismatches 43;
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Pred. No. 4.9e-100;
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Pizza, M.
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                          glycosyl transferase B (EC 2.4.-.) - Neisseria meningitidis C;Species: Neisseria meningitidis C;Species: Neisseria meningitidis C;Date: 12-Feb-1998 #sequence_revision 20-Feb-1998 #text_change 20-Sep-1999 C;Accession: S70814 R;Jennings, M.P.; Hood, D.W.; Peak, I.R.A.; Virji, M.; Moxon, E.R. Mol. Microbiol. 18, 729-740, 1995 A;Title: Molecular analysis of a locus for the biosynthesis and phase-variable expres A;Reference number: S70812; MUID:96414473; PMID:8817494 A;Accession: S70814
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C; Genetics:
A; Gene: lgtA2'; NMA052;
C; Superfamily: lipopoly
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A; Residues: 1-268 < PAR>
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A;Title: Complete DNA sequence of a serogroup A strain of Neisseria menigitidis Z2491 A;Reference number: A81775; MUID:20222556; PMID:10761919 A;Accession: B81971
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               C;Species: Neisseria meningitidis
C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C;Accession: B81971
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                        VMFDLKRALGKFGREKKKRMERQRQAELEKVYGRRVILFK 280
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                                                                                                  VDWMLFSSFLDKGGMTVCQLTPALCV-----
                                                                                                                                                VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGRRHRRSLK 240
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A81971
Lacto-N-neotetraose biosynthesis glycosyl transferase NMA0525 [imported] - C;Species: Neisseria meningitidis
C;Species: Neisseria meningitidis
C;Date: 05-May-2000 #sequence_revision 05-May-2000 #text_change 02-Feb-2001
C;Accession: A81971
C;Accession: A81971
C;Accession: A81971
C;Accession: A81971
C;Accession: A81971
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C;Superi
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C;Superfamily: lipopolysaccharic
C;Keywords: glycosyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   A;Status: preliminary; nucleic acid sequence not shown A;Molecule type: DNA A;Residues: 1-275 <JEN>
                     Qy
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A; Residues: 1-279 < PAR>
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                                                                                                                                                                                                                                                                                                                                                                                                                           A; Experimental source:
                                                                                                                                                                                                                                                                                                                                                                                                                                             A;Cross-references: GB:AL162753;
                                                                                                                                                                                                                                                                                                                                                                   Superfamily:
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                                                                                 LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
                                                                                                                                                       VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120
                                                                                                                                                                                                                                  MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKD----REQGRRHR 236
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    MQNHVISLASAAERRAHIADTFGRHGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG 60
                   VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDR--
                                                           LETMFMHVLTSPSGVADYCGRAFPLLESEHWGTAGYIISRKAMWFFLDRFAALPSEGLHP 180
                                                                                                                                                                                                            MQNHVISLASAAERRAHITDTFGVRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG 60
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                                                                                                                                 VEKACFMSHAVLWKQALDEGLPYIAVFEDDVLLGEGAEKFLAEDAWLQERFDPDSAFIVR
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70.4%;
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                                                                                                                                                                                                                                                                                                                                                                                                                         GB:AL157959; NID:g7379120; A, strain Z2491
                                                                                                                                                                                                                                                                                                      Score 971.5; DB 2; Pred. No. 5.3e-77;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NID:g973183; PIDN:AAC44085.1; PID:g973186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 1007; DB 2;
Pred. No. 4.2e-80;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Mismatches
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                                                                                                                                                                                                                                                                                                                           279;
-EQGRRHR 236
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Rajandream,
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A; Experimental source: strain Rd KW20 R; Cope, L.D.; Yogev, R.; Mertsola, J.
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lipopolysaccharide biosynthesis protein lic2A - Haemophilus influenzae C;Species: Haemophilus influenzae C;Species: Haemophilus influenzae C;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 28-Jul-2000 C;Accession: A64077; S15282; S39576 R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Ker Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; W, D.M.; Barandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, Science 269, 496-512, 1995 A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae A;Reference number: A64000; MUID:95350630; PMID:7542800 A;Accession: A64077 A;Status: nucleic acid sequence not shown; translation not shown
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        lipopolysaccharide biosynthesis protein lic2B - Hac
;Species: Haemophilus influenzae
C;Date: 15-reb-1997 #sequence_revision l3-Mar-1997
C;Accession: S71025
A; Molecule type: DNA
A; Residues: 1-302 <TIGR>
A; Cross-references: GB:U32736; GB:L42023;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       A;Cross-references: EMBL:Z54182; NID:g1150402; A;Experimental source: strain RM7004
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 A; Molecule type: DNA
A; Residues: 1-266 <HIG>
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             TMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKAVD 182
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     LMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQ--GRRHRRSLK 240
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 TFLNFSKCKDKKIKPYSGRKILKLVSENCGAAGYVISREAVKQLSAHICSLTSNHLLAID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PANTFKHRLIRALTKISREREKRRQRR-----EQLIGKIIVPFQ 279
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NYVISLTSAYQRREHIQKEFSQQNIPFEFFDALKPSKELTSLIEKFIPNL-LHAKLTEGE
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Pred. No. 4.9e-36;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          biosynthesis-associated
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NID:g1573519;
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M.; Weidman
gen, N.S.M.
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                                                                                                                                    ; Vente
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Latimer, J.L.;

Hanson,

M.S.; McCracken Jr.,

G

PIDN:AAC22208.1; PID:g1573535

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Mol. Microbiol. 5, 1113-1124, 1991
A;Title: Molecular cloning of a gene involved in lipooligosaccharide biosynthesis and v A;Title: Molecular cloning of a gene involved in lipooligosaccharide biosynthesis and v A;Reference number: S15282
A;Accession: S15282
A;Accession: S15282
A;Molecule type: DNA
A;Residues: 1-28,'N', 30-40,45-105,'L',107-150,'R',152-302 <COP>
A;Cross-references: EMBL:X56903; NID:948811; PIDN:CAA40221.1; PID:948812
A;Cross-references: EMBL:X56903; NID:948811; PIDN:CAA40221.1; PID:948812
A;Cross-references: EMBL:X56903; NID:948811; PIDN:CAA40221.1; PID:948812
A;Cross-references: EMBL:X66903; NID:948811; PIDN:CAA40221.1; PID:948812
A;Note: it is uncertain whether Met-1 or Met-11 is the initiator
R;High, N.J.; Deadman, M.E.; Moxon, E.R.
Mol. Microbiol. 9, 1275-1282, 1993
A;Title: The role of a repetitive DNA motif (5'-CAAT-3') in the variable expression of A;Reference number: S39576; MUID:95020659; PMID:7523834
A;Residues: 1-28,'N', 30-40,49-105,'L',107-150,'R',152-255,'P',257-273,'D',275-302 <HIG>A;Accession: S39576; MUID:95020659; PMID:7523834
A;Residues: 1-28,'N',30-40,49-105,'L',107-150,'R',152-255,'P',257-273,'D',275-302 <HIG>A;Experimental source: EMBL:L19441; NID:9305379; PIDN:AAA65534.1; PID:9305380
A;Experimental source: strain RM7004
C;Genetics:
A;Genetics:
A;Genetics:
A;Description: involved in lipooligosaccharide biosynthesis and virulence expression C;Superfamily: lipopolysaccharide biosynthesis-associated protein
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, C.M.; Smith, H.O.; A;Title: Whole-genome random sequencing and assembly of Haemophilus influenzae FA;Reference number: A64000; MUID:95350630; PMID:7542800
A;Accession: F64091
A;Status: nucleic acid sequence not shown; translation not shown
A;Molecule type: DNA
A;Residues: 1-282 <TIGR>
A;Cross-references: GB:U32760; GB:L42023; NID:g1573764; PIDN:AAC22423.1; PID:g15C;Genetics:
A;Start codon: GTG
                                                                                                                                                                                                                              lipopolysaccharide biosynthesis protein lic2B homolog - Haemophilus influenzae C;Species: Haemophilus influenzae C;Species: Haemophilus influenzae C;Date: 18-Aug-1995 #sequence_revision 18-Aug-1995 #text_change 20-Sep-1999 C;Accession: F64091 R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Ker;Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; W D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen, Science 269, 496-512, 1995
                                                                                                                                                                                                                                                                                                                                                                                                                       RESULT
F64091
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         VFLNQNEWLKTRFDFNDIFIIRLETFLQPVKLEKQTKIPPFNSRNFDILKSTHWGTAGYI 183
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MQNHVISLASAAERRAHIADTFGSRGIPFQFFDAL-----
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         KSVLTSGLEKERQKRSKIRKKKTLKQRLTRIKENIIRAL----NRKKWKEQQRIKEMQ-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ISQGAAKYVIEYLKNIPSDEIVAVDELIFNKLVDVDNYIVYQLNPAICIQELQANQ---S
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ISREAMREFLDREAVLPPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   QFLAEDTWLEERFDKDSAFIVRLETMFAKV-IVRPDKVLNYENRSFPLLESEHCGTAGYI 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 NQSINQSNSILHNIEESRILTKGEKGCLISHFLLWNKCVNENFEYLKIFEDDVILGENAE 123
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EQAMAE---LVPGLSAHPYLSGVEKACFMSHAVLMEQALDEGLPYIAVFEDDVLLGEGAE 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        IENIVISMENATERRKHITKQFESKKLSFSFFNAYTYQSINQSINQSINQSINQSINQSI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   involved in lipooligosaccharide biosynthesis and virulence expression lipopolysaccharide biosynthesis-associated protein
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Conservative
                                               GB:U32760; GB:L42023; NID:g1573764; PIDN:AAC22423.1; PID:g1573773;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     30.5%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           68; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 438.5;
Pred. No. 1.
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                                                                                                                                                                                                           Venter,
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C; Species: Brucella m
C;Date: 01-Feb-2002 #
C;Accession: AD3304
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A; Map position: I
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A; Residues: 1-268 < KUR>
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                                                                                            DLEKDREQGRR--HRRSLKVMFDLKRALGKFGREKKKRMERQRQ
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C; Superfamily: lipopolysaccharide biosynthesis-associated protein 21.9%; Score 315; Pred. No. 7 DB 2; '.4e-20;

54;

Mismatches

105;

Indels

24;

Gaps

9;

3 NHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHP--YLSG NYVISLTTEQKRRKHITEEFGKQNIPFEFFDAITP-DIIEETAKKFNITLDRSPKAKLSD 92 60

VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120

GEIGCALSHIVLWDLALENNLNYINIFEDDIHLGENAKELLEID-----YISDDIHVLK 146

LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180 LEAN-GKMFFKQPKSVKCDRNVYPMTVKQ-SGCAGYTVTAKGAKYLLELVKNKPLD--VA

202

VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLE---KDREQGRRHRRS VDSLVFEDFLHFKDYKIVQLSPGICVQDF----VLHPDNPFESSLQEGRDRVHGNQRKSS 238 258

LKVMFDLKRALGKFGREKKKRMERQ 263

278

biosynthesis protein lic2B [imported] - Brucella melitensis melitensis $\ensuremath{\mathsf{melitensis}}$ #sequence_revision 01-Feb-2002 #text_change 01-Feb-2002 (stra

R;DelVecchio, V.G.; Kapatral, V.; Redkar, R.J.; Patra, G.; Mujer, C.; Los, T.; Ivanov ; Mazur, M.; Goltsman, E.; Selkov, E.; Elzer, P.H.; Hagius, S.; O'Callaghan, D.; Let Proc. Natl. Acad. Sci. U.S.A. 99, 443-448, 2002
A;Title: The genome sequence of the facultative intracellular pathogen Brucella melit A;Reference number: AD3252; PMID:11756688
A;Accession: AD3304

A;Cross-references: GB:AE008917; PIDN:AAL51599.1; PID:g17982323; GSPDB:GN00190

Conservative 16.2%; 29.2%; 39; Score 233; DB 2; Pred. No. 9.6e-13; Mismatches Length 268 Indels 68; Gaps 12;

MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPY---MKCYLINLDKSRDRLEFMASQFERLGAQF-----ERVEAVNGRAMSPLELASFTQI 59 57

SKEWPAPLSPAEIGCFLSHRKCLEKIAAGEDAYAAVFEDDIRLSQGSSRFLASDHWIPKQ -----LSGVEKACFMSHAVIWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEER 110 119

FDKDSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRF AD-----IVKIDAYGHEVLI-SNPVKNEGPYSISRLRSRHLQTGGYVVSREAAR-----170 167

KLLPLMEKVSAPVD----HFLFDPNDGPFNDFEIYQISPAICRQ----AVLP-PERIKA-VDLMMFTYFFDKEGMP-----VYQVSPALCTQELHYAKFLSQNSMLGS 223 208

243 265

GMESTIGQNRRPKQRPSL----LGLVWREAKRLVMRTRR

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C; Geneti
A; Note:
                                                                                                                                                                                                                                                                                                                 C;Date: 12-Feb-1999 #sequence_revision 12-Feb-1999 #text_change 08-Oct-1999 (?;Accession: E71916 R;Alm, R.A.; Ling, L.S.L.; Moir, D.T.; King, B.L.; Brown, E.D.; Doig, P.C.; Smith; Ives, C.; Gibson, R.; Merberg, D.; Mills, S.D.; Jiang, Q.; Taylor, D.E.; Vovis, Nature 397, 176-180, 1999
                   멍
                                                                                                                                                                                               A; Molecule type: DNA
A; Residues: 1-332 <ARN>
A; Cross-references: GB: AE001489; GB: AE001439;
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A;Reference number: Z14086;
A;Accession: T00343
                                             δÃ
                                                                                                                                                                                 A; Experimental source: strain J99
                                                                                                                                                                                                                                                   A;Status: preliminary
                                                                                                                                                                                                                                                                  A; Reference number: A71800; A; Accession: E71916
                                                                                                                                                                                                                                                                               A; Title: Genomic sequence comparison of two unrelated isolates of the human A; Reference number: A71800; MUID:99120557; PMID:9923682
                                                                                                                                                                                                                                                                                                                                                                                                     A; Variety: strain J99
                                                                                                                                                                                                                                                                                                                                                                                                                   probable lipopolysaccharide biosynthesis protein -
C:Species: Helicobacter pylori
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Cross-references: EMBL: AB011156;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Molecule type: mRNA
A; Residues: 1-738 <NAG>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          A;Status: preliminary; translated from GB/EMBL/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                R;Nagase, T.; Ishikawa, K.; Miyajima, N.; Tanaka, A.; Kotani, H.; DNA Res. 5, 31-39, 1998
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 C; Accession: T00343
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         C;Species: Homo sapiens (man)
C;Date: 01-Feb-1999 #sequence_revision 01-Feb-1999 #text_change 21-Jul-2000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                hypothetical protein KIAA0584 - human (fragment)
                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     171 A-VLPPERIKAV-----DLMMFTYFFDKEGMPVYQVSPALCTQELHYA---KFLS----
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        518 LTRG-EIGCFLSHYSVWKEVIDRELEKTLVIEDDVRFEHQFKKKLMKLMDNIDQAQLDWE 576
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        458 MINLKRRKDRRDRMLRTLYEQEIEVKIVEAVDGKALNTSQLKALNIEMLPGYRDPYSSRP 517
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           57 YLSGVEKACFMSHAVLMEQALDEGLPYIAVFEDDVLLGEGAEQFLAE--DTWLEERFDKD 114
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              KIAA0584
                                              4 HVISLASAAERRAHIADT-----
                                                                                                                                                 jhp0562
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        LIYIGRKRMQ----VKEPEKAVPNVAN----LVEADYSYWTLGYVISLEGAQKLVGANPF
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SAFIVRLETMFAKVIVRPDK-VLNYENRSFPLLESEHC-GTAGYIISREAMRFFL--DRF 170
               YIISLKESQRR-----LDTEKLVLESNEKFKGRCV-FQIFDAISPKHQDFEKLLQELYNAQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         TIWDNETVATDWDRTHAWKSRKQSR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ---QNSMLGSDLE-----KDREQGR 233
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        GKMLPVDEFLPVMYNKHPVAEYKEYYESRDLKAFSAEP-LLIYPTHYTGQPGYLSDTETS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            61;
                                                                                                   Similarity
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                                                                                 Conservative
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                                                                                                 8.4%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             coding sequences of unidentified; MUID:98290545; PMID:9628581
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          51;
                                                                                 47;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Score 121; DB 2; Pred. No. 0.019;
                                                                            Score 120.5; DB 2;
Pred. No. 0.0078;
7; Mismatches 98;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NID: g3043691; PIDN: BAA25510.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Mismatches
                                 FGSRGIPFQFFDALMPSER-LEQAMAELVPGL 52
                                                                                                                                                                                                NID:g4155102;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          107;
                                                                                                                                                                                                                                                                                                                                                                                                                                  Helicobacter pylori (strain
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Length 738;
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                                                                                                             Length
                                                                                                                                                                                                PIDN: AAD06135.1;
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                                                                               125;
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                                                                               21;
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                                                                                                                                                                                                PID:g41551
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                                                                                                                                                                                                                                                                                                                                                                                                                                      J99)
                                                                                                                                                                                                                                                                                                                                 G.F.;
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                                                                                                                                                                                                                                                                                                                                                                                                   A; Experimental source: strain A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     A; Accession: S27580
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A; Molecule type: DNA
A; Residues: 1-267 <TIGR>
                                                                                                                                                                                                                                                                                                                                    Matches
                                                                                                                                                                                                                                                                                                                                                                Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           230
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                                                                                                                                                                                                                                                                                                                                                 Local Similarity
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                                                                                                                                                               RFDKDSAFI--
                                                                                                                                                                                                                                                                                                                                 Conservative
                                                                                                                                                                                                                                                                                                                                                 7.5%;
22.1%;
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Science 269, 496-512, 1995
A;Authors: Gnehm, C.L.; McDonald, L.A.; Small, K.V.; Fraser, A;Title: Whole-genome random sequencing and assembly of Haema A;Reference number: A64000; MUID:95350630; PMID:7542800
A;Accession: E64175
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            A;Molecule type: DNA
A;Residues: 11-26,'K',28-39,'I',41-55,'S',57-111,'L',113-136,'N',138-139,'N',141-143
A;Cross-references: EMBL:M94855; NID:g148931; PIDN:AAA24981.1; PID:g148935
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        R;McLaughlin, R.; Abu Kwaik, Y.; Young, R.; Spinola, S.; Apicella, submitted to the EMBL Data Library, June 1992
A;Description: Characterization and sequence of the lsg locus from A;Reference number: S27577
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      R;Fleischmann, R.D.; Adams, M.D.; White, O.; Clayton, R.A.; Kirkness, E.F.; Ko; Gocayne, J.D.; Scott, J.; Shirley, R.; Liu, L.I.; Glodek, A.; Kelley, J.M.; D.M.; Brandon, R.C.; Fine, L.D.; Fritchman, J.L.; Fuhrmann, J.L.; Geoghagen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Cross-references: GB:L42023; TIGR:HI1697
A;Experimental source: strain Rd Kw20
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A; Status: nucleic acid sequence not shown; translation not
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               hypothetical protein HI1697 (1sg locus) -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ;Species: Haemophilus influenzae;Date: 18-Aug-1995 #sequence_revision
IENPVLISNLESVRGSLSNNLLKKLMKYPLKKIFAIKKNL
                                                                                                                                                                                                                                                                                                                                                                                                                             YLSGVEK---ACFMSHAVLWEQALDEG----LPYIAVFEDDVLLGEGAEQFLAEDTWLEE 109
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MONHVISLASAAERRAHIADTFGSR--GIPFQFFDALMPSERLEQAMAEL--VPGLSAHP
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                                                         SQNSMLGSDLEKDREQ-----GRRHRRSLKVMFDLKRAL
                                                                                                                        YLIKKSAARRFIQQISQNKPFWL-ADDFLLFEQNFNIRNKVVRPL
                                                                                                                                                                                                                                              KLEAEIILLGQSKINDFNDFDLEINYPTTFSFLCKKTGDV----NYAFP-YKSYFAGTVG
                                                                                                                                                                                                                                                                                                                                                                 YFRNVTKGEIGCTLSHLSVYQKIVEDNDIAEDSYALVCEDDALFHSDFQQNLT--ALLSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LKKYLISLDKDIQRR----ELFFSQKNTEDFQVFSAINTMQKDWDELAAIFNIEQFKAH-
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                                                                                                                                                                                  YIISREAMRFFLDRFAVLPPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFL 215
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EDC-LKSPFD-----FVRLYGCYWYYHETKFHVLPKEFVFPPFDHSFKNN--PILEKFKK
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   51; Mismatches 110;
                                                                                                                                                                                                                                                                                                        -VRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAG 155
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Score 108.5; DE Pred. No. 0.066;
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Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           locus from Haemophilus
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Smith,
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1.; Weidman
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probable lipopolysaccharide biosynthesis protein - Helicobacter pylori (strain J99) C;Species: Helicobacter pylori A;Variety: strain J99
C;Date: 12-Feb_1999 #sequence_revision 12-Feb-1999 #text_change 20-Sep-1999
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A;Accession: B64623
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Nature 388, 539-547, 1997
Nature 388, 539-547, 1997
Nature 388, 539-547, 1997
Nature 388, 539-547, 1997
Nature 388, 539-547, 1997
Nature 388, 539-547, 1997
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Nature 388, 539-547,
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                                                                                                                                 C; Superfamily: lipopolysaccharide blosynthesis-associated protein
                                                                                                                                                                                                                                                                   A;Cross-references: GB:AE001507; GB:AE001439; NID:g4155326; PIDN:AAD06344.1; PID:g41553 A;Experimental source: strain J99
                                                                                                                                                                                                                                                                                                                                                       A; Molecule type: DNA
A; Residues: 1-273 <ARN>
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A; Residues: 1-273 <TOM>
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3;Species: Helicobacter pylori
3;Date: 10-Sep-1999 #sequence_revision 10-Sep-1999 #text_change 09-Jun-2000
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Score 99; DB 2; Pred. No. 0.45;
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                                              Length 273;
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209 KWVVPVDTIMDATFIHGVKNLVLQPFVIADDEQISTIARKEEPYSPKIALMRELHF-KFL
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                                                                                                IVRLETMFAKVIVRPDKVLNYENRSFP-----LLESEHCGTAGYIISREAMRFFL--DR 169
                                                                                                                                                                                                        QIFDAIY-SKTFEGGLHPLVK-KHLHPYFITQNIKDMGIATSLISEVSKFYYALKYHAKF 95
                                                                                                                                     MSLGELGCYASHYSLWQKCIELN-EAICILEDDITLKEDFKEGL---DFLEKHIQE--LG 149
                                                                                                                                                                       -----ACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAF 117
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Search completed: December 2, 2002, 12:00:12 Job time: 14.4266 secs

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Minimum
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       Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
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Science 287:1809-1815(2000).
--- FUNCTION: ADDS THE FIRST GALACTOSE TO THE LACTO-N-TETRAOSE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN=MC58 / Serogroup B;
MEDLINE=96414473; PubMed=8817494;
MEDLINE=96414473; PubMed=8817494;
Jennings M.P., Hood D., Peak I.R.A., Virji M., Moxon E.R.;
Jennings M.P., Hood D., Peak I.R.A., Virji M., Moxon E.R.;
"Molecular analysis of a locus for the biosynthesis and phase-variable expression of the lacto-N-neotetraose terminal lipopolysaccharide structure in Neisseria meningitidis.";
mol. Microbiol. 18:729-740(1995).
                                                                                   SEQUENCE
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Pfam; PF01755; Glyco_transf_25; 1.
Lipopolysaccharide biosynthesis; Transferase; Glycosyltransferase;
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use by non-profit institutions as long as its content is in
modified and this statement is not removed. Usage by and for con
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Bacteria; Proteobacteria; beta subdivision; Neisseriaceae;
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Best Local
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Pfam; PF01755; Glyco_transf_25; 1.

Lipopolysaccharide biosynthesis; Transferase; Gl
SEQUENCE 279 AA; 31776 MW; C2219D1A6119D622
                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through a collab between the Swiss Institute of Bioinformatics and the EMBL outst the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for comentities requires a license agreement (See http://www.isb-sib.ch/an
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15-JUN-2002 (Rel.
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Bacteria; Proteobacteria;
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-1- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 25.
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16-OCT-2001
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Jennings M.P., Hood D., Peak I.R.A., Virji M., Moxon E.R.; "Molecular analysis of a locus for the biosynthesis and phase-variable expression of the lacto-N-neotetraose terminal lipopolysaccharide structure in Neisseria meningitidis."; Mol. Microbiol. 18:729-740(1995).
                                                                                                                                                                                                                                                              the European Bioinformatics Institute. There are no restrictions use by non-profit institutions as long as its content is in modified and this statement is not removed. Usage by and for cor entitles requires a license agreement (See http://www.isb-sib.ch/aror send an email to license@isb-sib.ch).
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-!- FUNCTION: ADDS THE SECOND GALACTOSE TO
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MEDLINE=96414473; PubMed=8817494;
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15-JUN-2002 (Rel. 41, Last annotation update)
Lacto-N-nectetraose biosynthesis glycosyl transferase lgtB
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Pfam; PF01755; Glyco_transf_25; !
Lipopolysaccharide biosynthesis;
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MEDLINE=20175755; PubMed
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Matches
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Davies R.M., Davis P., Devlin K., Feltwell T., Hamlin N., Holroy
Jagels K., Leather S., Moule S., Mungall K., Quail M.A.,
Rajandream M.A., Rutherford K.M., Simmonds M., Skelton J.,
Whitehead S., Spratt B.G., Barrell B.G.;
"Complete DNA sequence of a serogroup A strain of Neisseria
meningitidis 22491.";
Nature 404.505
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Lipopolysaccharide biosynthesis;
                                                                                                    entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                the European Bioinformatics Institute. There use by non-profit institutions as long as modified and this statement is not removed. U
                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way
                                                                                                                                                                                                                                                                                                                                                                                                                            STRAIN=Z2491 / Serogroup A / Serotype 4A;
MEDLINE=20222556; PubMed=10761919;
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15-JUN-2002 (Rel. 41, Last annotation update)
Lacto-N-nectetraose biosynthesis glycosyl tra
                                                                       EMBL; AL162753; CAB83817.1; -.
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Bacteria; Proteobacteria;
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   8703B56513A0D347 CRC64;
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subdivision;
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    Transferase; Glycosyltransferase;

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High N.J., Jennings M.P., MOXON R.E.;
Submitted (JAN-1996) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: INVOLVED IN EXTRACELLULAR LIPOOLIGOSACCHARIDES (LOS)
BIOSYNTHESIS AND VIRULENCE EXPRESSION. INVOLVED IN THE SYNTHESIS
OF THE OLIGOSACCHARIDE MOIETY OF THE LOS MOLECULE BY ADDING GALAC
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15-JUN-2002
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PF01755; Glyco_transf_25; 1.
ferase; Glycosyltransferase; Virulence.
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Q03974; Q48209;
Q1-NOV-1995 (Rel. 3
Q1-NOV-1995 (Rel. 3
15-JUN-2002 (Rel. 4
                                                                                                           High N.J., Deadman M.E., MOXON E.R.;

"The role of a repetitive DNA motif (5'-CAAT-3') in the variable "The role of a repetitive DNA motif (5'-CAAT-3') in the variable appression of the Haemophilus influenzae lipopolysaccharide epitope alpha Gal(1-4)beta Gal.";

MOI. Microbiol. 9:1275-1282(1993).

-!- FUNCTION: INVOLVED IN EXTRACELLULAR LIPODLIGOSACCHARIDES (LOS) BIOSYNTHESIS AND VIRULENCE EXPRESSION. INVOLVED IN THE SYNTHESIS OF THE OLIGOSACCHARIDE MOIETY OF THE LOS MOLECULE BY ADDING GALAC.

-!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 25.

-!- CAUTION: IT IS UNCERTAIN WHETHER MET-1 OR MET-11 IS THE INITIATOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STRAIN=Rd / KW20 / ATCC 51907;

MEDLLINE=95350630; PubMed=7542800;

Fleischmann R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F.

Fleischmann R.D., Adams M.D., White O., Clayton R.A., Kirkness E.F.

Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick J.M.

McKenney K., Sutton G., Fitzhugh W., Fields C.A., Gocayne J.D.,

Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M.,

Weidman J.F., Phillips C.A., Spriggs T., Hedblom E.D., Cotton M.D.,

Weidman J.F., Phillips C.A., Spriggs T., Hedblom E.D., Cotton M.D.,

Utterback T.R., Hanna M.C., Nguyen D.T., Saudek D.M., Brandon R.C.

Fine L.D., Fritchman J.L., Fuhrmann J.L., Geoghagen N.S.M.,

Gnehm C.L., McDonald L.A., Small K.V., Fraser C.M., Smith H.O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE=92065807; PubMed=1956289;
Cope L.D., Yogev R., Mertsola J.,
McCracken G.H. Jr., Hansen E.J.;
                                                                                                                                                                                                                                                                                                                                                                                                                    STRAIN=RM 7004 / Serotype B;
MEDLINE=95020659; PubMed=7523834;
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biosynthesis and virulence expression
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                                 SWISS-PROT entry is copyright. It is produced through a collaboration sen the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Microbiol. 5:1113-1124(1991).
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MEDLINE=95301198; PubMed=7781993;
Potter M.D., Lo R.Y.C.;
"Cloning and characterization of a gene from Pasteurella A1 involved in lipopolysaccharide biosynthesis.";
FEMS Microbiol. Lett. 129:75-81(1995).
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15-JUN-2002 (Rel.
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                                                                                                                            Bacteria;
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                                                                                                                                                               protein
                                                                                                                                                                                                                                                                                                                                                                                                                                    QFLAEDTWLEERFDKDSAFIVRLETMFAKV-IVRPDKVLNYENRSFPLLESEHCGTAGYI 157
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        VYGRRVILF
                                                                                                                                                                                                                                                                                                                                                                                       ISREAMREFLDREAVLPPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQ
                                                                                                                                                                                                                                                                                                                                                                                                                        VFLNQNEWLKTRFDFNDIFIIRLETFLQPVKLEKQTKIPPFNSRNFDILKSTHWGTAGYI
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    NOSINOSNSILHNIEESRILTKGEKGCLISHFLLWNKCVNENFEYLKIFEDDVILGENAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EQAMAE --- LVPGLSAHPYLSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAE 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  IENIVISMENATERRKHITKQFESKKLSFSFFNAYTYQSINQSINQSINQSINQSINQSI
                                                                                                                                                                                                                                                                                                                             KSVLTSGLEKERQKRSKIRKKKTLKQRLTRIKENIIRAL----
                                                                                                                                                                                                                                                                                                                                                    NSMLGSDLEKDREQGRRHR-----RSLKVMFDLKRALGKFGREKKKRMERQRQAELEK
                                                                                                                                                                                                                                                                                                                                                                          ISQGAAKYVIEYLKNIPSDEIVAVDELIFNKLVDVDNYIVYQLNPAICIQELQANQ---S
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                             Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Conservative
                                                                                                                                                                                                                                                                                                       279
                                                                                                                                                                                                                          STANDARD;
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33,
41,
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Last
                                                                                                                                                                                                   Created)
                                                                                                                             gamma subdivision; Pasteurellaceae;
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K -> N (IN STRAINS DL42 AND RM 7004)

MISSING (IN STRAIN RM 7004).

MISSING (IN STRAIN DL42).

F -> L (IN STRAINS DL42 AND RM 7004)

Q -> R (IN STRAINS DL42 AND RM 7004)

S -> D (IN STRAIN RM 7004).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                68;
                                                                                                                                                                            annotation
                                                                                                                                                                                     sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Pred. No. 1.20
8; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 438.5;
                                                                                                                                                                                                                         PRT;
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                                                                                                                                                                                     update)
                                                                                                                                                                                                                         263
                                                                                                                                                                           update;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   DB 1;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      302;
                                    haemolytica
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               41;
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Y765_HAEIN
Y765_HAEIN
Sin...
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f 01-NOV-1997 (Rel. 35, Created)
T 01-NOV-1997 (Rel. 35, Last sequence to 15-JUN-2002 (Rel. 41, Last annotation continuous formula for the continuous formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula formula 
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Best Local
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STRAIN-Rd / KWZU / NACCESTRAIN-RD / KWZU / NACCESTRAINE-95350630; PubMed-7542800; MDLJNB-95350630; PubMed-7542800; Pielschmann R.D., Adams M.D., White O., Clayton R.A., Kirkness Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick Kerlavage A.R., Bult C.J., Tomb J.-F., Dougherty B.A., Merrick McKenney K., Sutton G., Fitzhugh W., Fields C.A., Gocayne J.D., Scott J.D., Shirley R., Liu L.-I., Glodek A., Kelley J.M.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             This
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J. Bacteriol. 173:5597-5603(1991).

-i- FUNCTION: INVOLVED IN THE BIOSYNTHESIS

OF THE LIPOPOLYSACCHARIDE MOLECULE.

-i- SUBCELLULAR LOCATION: CYTOPLASMIC. ASSE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               use by non-profit institutions as long modified and this statement is not removed. entitles requires a license agreement (See or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                    Bacteria; P
Haemophilus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Lipopolysaccharide SEQUENCE 263 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      OF THE CYTOPLASMIC MEMBRANE (POTENTIAL).
-I- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 25
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MEDLINE=91358346; PubMed=1885539; Abdullah K.M., Lo R.Y.C., Mellors
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STRAIN-Serotype A1;
                                                                                                                                                                                   SEQUENCE
                                                                                                                                                                                                                            NCBI_TaxID=727;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL; U15958; AAA80283.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       between
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          s SWISS-PROT entry is copyright. It is produced through ween the Swiss Institute of Bioinformatics and the EN European Bioinformatics Institute. There are no restr
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                LETMFAKVIVRPDKVLNY-ENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIK 179
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MNNYVISLTSAQERRKHIEAEFGKQNIPFQFFDAITPDLIKEKAKAFNID--ISNTNLTK 58
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG
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                                                                                                                                                        NW N.A.
KW20 / ATCC 51907;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                biosynthesis;
30871 MW; E
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                                                                                                                                                                                                                                                                                                                                                                    Last sequence up
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 331.5; DE 
Pred. No. 9e-21; 
1; Mismatches 1
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                                                                                                                                                                                                                                                                          subdivision;
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Best Local S
Matches 82
                                                                                                                                                                           LSG4_HAEIN STANDAND,
LSG4_HAEIN STANDAND,
P71398; Q48213;
30-MAY-2000 (Rel. 39, Created)
30-MAY-2000 (Rel. 39, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation updat
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
SEQUENCE FROM
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Fine L.D., Fritchman J.L., Gnehm C.L., McDonald L.A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Weidman J.F., Phillips C.A., Utterback T.R., Hanna M.C., 1
                          Submitted
                                        "Characterization influenzae.";
                                                                                   STRAIN-A2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Hypothetical protein; Transferase; Glycosyltransferase
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Rd.";
Science 269:496-512(1995)
                                                                 McLaughlin R.,
                                                                                               SEQUENCE FROM N.A.
                                                                                                                          NCBI_TaxID=727;
                                                                                                                                        Haemophilus
                                                                                                                                                    Bacteria; Proteobacteria; gamma
                                                                                                                                                                     Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 InterPro; IPR002654; GT_25.
Pfam; PF01755; Glyco_transf_25; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     -!- SIMILARITY: BELONGS TO THE GLYCOSYLTRANSFERASE FAMILY 25.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 "Whole-genome random sequencing and assembly of Haemophilus influenzae
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Venter J.C.;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           NYVISLTTEQKRRKHITEEFGKQNIPFEFFDAITP-DIIEETAKKFNITLDRSPKAKLSD 92
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      NHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHP--YLSG
                                                                                                                                                                                                                                                                                                                                              I-----LEKIKNEFGRVKIKMFGKQ
                                                                                                                                                                                                                                                                                                                                                                         LKVMFDLKRALGKFGREKKKRMERQ 263
                                                                                                                                                                                                                                                                                                                                                                                                      VDSLVFEDFLHFKDYKIVQLSPGICVQDF---
                                                                                                                                                                                                                                                                                                                                                                                                                                VDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLE---KDREQGRRHRRS
                                                                                                                                                                                                                                                                                                                                                                                                                                                           LEAN-GKMFFKQPKSVKCDRNVYPMTVKQ-SGCAGYTVTAKGAKYLLELVKNKPLD--VA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       LETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA 180
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  GEIGCALSHIVLWDLALENNLNYINIFEDDIHLGENAKELLEID-----YISDDIHVLK 146
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                         (JUN-1992)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            282
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N.A
                                                                  Abu Kwaik Y.,
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                                                     and
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                          ç
                                                    sequence of
                         the EMBL/GenBank/DDBJ databases
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Small K.V., Fraser C.M., Smith H.O.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Nguyen D.T., Saudek D.M., Brandon R.
                                                                  Young
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 315;
Pred. No. 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           D962E402AA207A18 CRC64;
                                                                                                                                                                                                                                                                                                                                              278
                                                                                                                                                    subdivision; Pasteurellaceae;
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                                                  Spinola S.,
lsg locus fro
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2.4e-19;
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                                                                  Apicella
                                                     Haemophilus
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RESULT 11
AAT_AQUAE
ID AAT_A
AC 06778
AC 30-M2
DT 30-M2
DT 16-OC
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Best Local
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                                   AAT_AQUAE
067781;
30-MAY-2000
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            30-MAY-2000 (Rel.
30-MAY-2000 (Rel.
16-OCT-2001 (Rel.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; U32842; AAC23343.1;
EMBL; M94855; AAA24981.1;
TIGR; HI1697; -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the EM the European Bioinformatics Institute. There are no restruse by non-profit institutions as long as its content use by non-profit institutions as long as its content modified and this statement is not removed. Usage by and
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Pfam;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           STRAIN=Rd / KW20 / ATCC 51907;
MEDLINE=95350630; PubMed=75428
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Complete
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                InterPro;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Science 269:496-512(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Venter J.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          "Whole-genome random sequencing and
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                                                                                                                                                                                                                                                                                                            LKKYLISLDKDIQRR----ELFFSQKNTEDFQVFSAINTMQKDWDELAAIFNIEQFKAH- 56
                                                                                                                                                                                                                                                                                                                                  MONHVISLASAAERRAHIADTFGSR--GIPFQFFDALMPSERLEQAMAEL--VPGLSAHP
                                                                                                                     IENPVLISNLESVRGSLSNNLLKKLMKYPLKKIFAIKKNL
                                                                                                                                            SQNSMLGSDLEKDREQ-----GRRHRRSLKVMFDLKRAL
                                                                                                                                                                                        YIISREAMRFFLDRFAVLPPERIKAVDLMMFTYFFDKEGMPVYQVSPALCTQELHYAKFL
                                                                                                                                                                                                                                                             YFRNYTKGEIGCTLSHLSVYQKIVEDNDIAEDSYALVCEDDALFHSDFQQNLT--ALLSE
                                                                                                                                                                                                                                                                             YLSGVEK---ACFMSHAVLWEQALDEG----LPYIAVFEDDVLLGEGAEQFLAEDTWLEE
                                                                                                                                                                   YLIKKSAARRFIQQISQNKPFWL-ADDFLLFEQNFNIRNKVVRPL--
                                                                                                                                                                                                                                                                                                                                                          62;
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30
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102
127
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                                                           STANDARD;
         39, Created)
39, Last sequence 40, Last annotation
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22.1%;
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                                                                                                                                                                                                                                                                                                                                                                                                         MV.
sequence update)
annotation update)
(EC 2.6.1.1) (Transaminase
                                                                                                                                                                                                                                                                                                                                                         51;
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1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                     Score 108.5;
Pred. No. 0.0
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Aspartate

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RESULT 12
GLND_RHILO
ID GLND_RHILO
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InterPro; IPR004839; Aminotransf1/2.
InterPro; IPR004838; NHtransf_1.
Pfam; PF00155; aminotran_1_2; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Transferase; Aminotransferase; Pyridoxal phosphate; Complete BINDING 239 PYRIDOXAL PHOSPHATE (BY SIMILAR)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Pfam; PF00155; aminotran_1_2; 1.

PRINTS; PR00753; ACCSYNTHASE.

PROSITE; PS00105; AA_TRANSFER_CLASS_1; FALSE_NEG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AE000766; AAC07746.1; -. HSSP; Q56232; 1BKG.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               This
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nature 392:353-358(1998).
-!- CATALYTIC ACTIVITY: L-aspartate + 2-oxoglutarate
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Deckert G., Warren P.V., Gaasterland T., Young W.G., Lenox A.L., Graham D.E., Overbeek R., Snead M.A., Keller M., Aujay M., Huber Feldman R.B., Short J.M., Olson G.J., Swanson R.V.; "The complete genome of the hyperthermophilic bacterium Aquifex
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  MEDLINE=98196666; PubMed=9537320;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Aquifex.
NCBI_TaxID=63363;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Bacteria; Aquificae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Aquifex aeolicus
                                                                              292
                                                                                                                                                                          194
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                                                                                                                                                                                                                                                                                                                                                                                                                                 9
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AMINOTRANSFERASES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            SWISS-PROT entry is copyright. It is produced through a collaboration een the Swiss Institute of Bioinformatics and the EMBL outstation -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           L-glutamate
                                                                           FVNEMRNAFERRRDTAVEELSKIPGMDVV
                                                                                                                                                                                                                                                                                       DDVLLGEGAEQFLAEDTWLEERFDKDSAFIVRLETWFAKVIVRPDK-VLN------Y 138
                                                                                                            FGREKKKRMERQRQA---ELEKVYGRRVI
                                                                                                                                                                        GMPVYQVSPALCTQELHYAKFL-SQNSMLGSDLEKDREQGRRHRRSLKVMFDLKRALGK-
                                                                                                                                                                                                                                      ENRSFPLLESEHCGTAG-YIISREAMRFFL--DRFAVLPPERIKAVDLMMFTY--FFDKE
                                                                                                                                                                                                                                                                                                                                                                 LMPSERLEQAMAELVPGLSAHPYLSGVEKACFMSHAVLWEQALDEG-----LPYIAVFE 88
                                                                                                                                                                                                                                                                                                                                                                                                AKAKELRAKGVDVIGFGAGEPDFDTPDFIKEACIRALREGKTKYAPSAGIPELREAIAEK 81
                                                                                                                                                                                                                                                                                                                                                                                                                                 ASAAERRAHIADTFG-----
                                                                                                                                         SMTGWRIGYVACPEE--YAKVIASLNSQSVSNVTTFAQYG-----
                                                                                                                                                                                                       EEEELKKI-AEFCVERGIFIISDECYEYFVYGDAKFVSPASFSDEVKNITFTVNAFSKSY
                                                                                                                                                                                                                                                                    EQIRFFGGVP------VEVPLKKEKGFQLSLEDVKEKVTERTKAIVINSPNNPTGAVY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            394 AA; 43777 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Conservative
   STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           6.9%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Aquificae (class); Aquificales; Aquificaceae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            PHOSPHATE (BY SIMILARITY).
TO CLASS-I OF PYRIDOXAL-PHOSPHATE-DEPENDENT
                                                                                                                                                                                                                                                                                                                                    ---AGAKMVLFL----IFMAILDEGDEVLLPSPYWVTYP 130
                                                                                                                                                                                                                                                                                                                                                                                                                                                              38;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Score 99;
Pred. No.
   PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           E570B4FD080C56E1 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Mismatches
                                                                                                            277
                                                                              320
   933
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1;
0.45;
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   ΑA
                                                                                                                                                                                                                                                                                                                                                                                                                                                              126;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 394;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       proteome
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Pfam; PF01966; HD; 1.
Pfam; PF01909; NTP_transf_2; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            15-JUN-2002 (Rel. 41, Created)
15-JUN-2002 (Rel. 41, Last sequence update)
15-JUN-2002 (Rel. 41, Last annotation update)
15-JUN-2002 (Rel. 41, Last annotation update)
15-JUN-2002 (Rel. 41, Last annotation update)
17-JUN-2002 (Rel. 41, Last annotation update)
17-JUN-2002 (Rel. 41, Created)
18-JUN-2002 (Rel. 41, Last sequence update)
18-J
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SMART; SM00471;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMBL; AP003006; BAB51794.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              This SWISS-PROT entry is copyright. It is produced through a between the Swiss Institute of Bioinformatics and the EMBL the European Bioinformatics Institute. There are no restrict use by non-profit institutions as long as its content is
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DNA Res. 7:331-338(2000).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              "Complete genome structure of the nitrogen-fixing symbiotic bacterium Mesorhizobium loti.";
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Mochizuki Y., Nakayama S., Nakazaki N., Shimpo S.,
Takeuchi C., Yamada M., Tabata S.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Kaneko T., Nakamura Y., Sato S., Asamizu E., Kato T., Sasamoto Watanabe A., Idesawa K., Ishikawa A., Kawashima K., Kimura T., Kishida Y., Kiyokawa C., Kohara M., Matsumoto M., Matsuno A.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STRAIN-MAFF303099;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Bacteria; Proteobacteria; alpha subdivision; Rhizobiaceae group; Phyllobacteriaceae; Mesorhizobium.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Complete proteome.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Transferase; Nucleotidyltransferase; Nitrogen fixation;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (glnB) regulatory protein.
-!- CATALYTIC ACTIVITY: UTP +
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406
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                                                                                                                                                           MFAKVIVRPDKV-LNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKAVD 182
                                                                                                                                                                                                                                                               ACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVRLET 123
                                                                                                                                                                                                                                                                                                                                                  HVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSGVEK 63
LLRLFWFADKHGLEFHPDALKLLTRSL.
                                                 LMMFTYFFDKEGMPVYQVSPALCTQELHYAKFLSQNSMLGSDLEKDREQGR
                                                                                                 EQAKHVPGFNRIFLTFQRRKRKL-----AGTSDFIVDNHRINIADDQVFERDP---
                                                                                                                                                                                                                                                                                                                      HMHFLTGKAEERLH------FD-----IQREIAERL-GYTTHPGLSAVER 330
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IPR002934; NTP_transf.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      105279 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                             6.6%; Score 95.5; D
22.1%; Pred. No. 2.6;
tive 31; Mismatches
                                                                                                                                                                                                               -YELVAKD---VG-
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  -GLVNKSLRRDEEANR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 DB 1;
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                                                                                                                                                                                                                                                                                                                                                                                                                                  72;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       diphosphate +
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length
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                                                                                                                                                                                                               DLTRIFCAALEE
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                                                                                                                                                                                                                                                                                                                                                                                                                               77;
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RESULT 13
SAD1_MOUSE

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Best Local S
Matches 54
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SMART; SM0045...
SMART; SM0045...
PROSITE; PS50105; SA...
Interferon induction.
11 SAM.
165 320 HD.
165 320 HD.
17 NA; 72650 MW; C
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SAMHD1 OR MG11.

Mis mucc.
                                                                                                                                                                                                                                                                                                      Pfam; PF00536; SAM; 1.
Pfam; PF01966; HD; 1.
SMART; SM00471; HDc; 1.
SMART; SM00454; SAM; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                the European Bioinformatics Institute. The use by non-profit institutions as long modified and this statement is not removed. entitles requires a license agreement (See
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               -i- INDUCTION: By interferon gamma.
-i- SIMILARITY: CONTAINS 1 SAM DOWAIN.
-i- SIMILARITY: CONTAINS 1 DOWAIN.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        induced in mouse peritoneal macrophages
binding protein.";
J. Leukoc. Biol. 57:477-483(1995).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 This SWISS-PROT entry is copyright. It is produced through between the Swiss Institute of Bioinformatics and the El
                                                                                                                                                                                                                                                                                                                                                         InterPro; IPR003607; ME_Pplase_HDc
InterPro; IPR001660; SAM.
                                                                                                                                                                                                                                                                                                                                                                                   InterPro; IPR002819; HD.
                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; U15635; AAA66219.1; ALT_FRAME.
                                                                                                                                                                                                                                                                                                                                                                                                                                                   or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Submitted (AUG-2001) to the EMBL/GenBank/DDBJ databases
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Strausberg R.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   TISSUE=Breast;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Lafuse W.P., Brown D., Castle L., Zwilling "Cloning and characterization of a novel c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TISSUE=Macrophage;
MEDLINE=95190404; PubMed=7884320;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            NCBI_TaxID=10090;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota; Metazoa;
Mammalia; Eutheria;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Mus musculus (Mouse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Q60710;
01-NOV-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SAD1_MOUSE
  217
                            255
                                                      167
                                                                                  219
                                                                                                         107
                                                                                                                                   174
                                                                                                                                                             57
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      CAUTION: Ref.1 sequence differs from that shown due to frameshift in position 576.
                                                                                                                                                                                                                                                                                                                                                                                               MGI:1927468; Samhdl.
QNSMLGSDLEK-DREQGRRHRRSLKVMFDLKRALGKFGREKKKRMERQRQAELEKVYGRR
                                                  LDRFAVLPPERIKAVDLMMFTYFFDKE---GMPVYQVSPAL-----CTQELHYAKFLS
                                                                              -----DGRFIPR-----ARPEKKWKHEQGSIEMFE-----HLVNSNELKLV 254
                                                                                                      LEERFDKDSAFIVRLETMFAKVIVRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFF 166
                                                                                                                                  YLAG----CLV-----RALAEKQPELQISERDILCVQIAGLCHDLGHGPFSHMF----
                                                                                                                                                          YLSGVEKACFMSHAVLWEQALDEGLPYIAVFEDDVL------LGEGAEQFLAEDTW 106
                                                                                                                                                                                                                                                                                                                                                                                                             BC012721; AAH12721.1;
                                                                                                                                                                                                  Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      (Rel. 41, Last sequence up
(Rel. 41, Last annotation
                                                                                                                                                                                       Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            35, Created)
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Rodentia;
                                                                                                                                                                                                 6.2%; Score 89.5;
22.4%; Pred. No. 5
                                                                                                                                                                                      34;
                           -FIKEQIMGPPITPVKDSLWPYKGRPATKSFLYE--IV
                                                                                                                                                                                                                                       SAM.
HD.
; C68BB653C3F4B17C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Craniata; Vertebrata; I
Sciurognathi; Muridae;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PRT;
                                                                                                                                                                                      Mismatches
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cDNA that is IFN-gamma-
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                                                                                                                                                                                                             DB 1; Length 627;
                                                                                                                                                                                      76;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Usage
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VNCS_BMDNV
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Best Local
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P05842;
01-NOV-1988 (Rel. (
01-NOV-1988 (Rel. (
15-JUL-1999 (Rel. )
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              STRAIN-ISOLATE INA;
MEDITAB-#87112952; PubMed=3027382;
Bando H., Kusuda J., Gojobori T., Maruyama T., Kawase "Organization and nucleotide sequence of a densovirus host-dependent evolution of the parvoviruses.";
J. Virol. 61:553-560(1987).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  01-NOV-1988 (Rel. 09, Created)
01-NOV-1988 (Rel. 09, Last sequence update)
15-JUL-1999 (Rel. 38, Last annotation update)
Putative noncapsid protein NS-1 (Nonstructural protein NS Bombyx densonucleosis virus (BmDNV) (Silkworm densovirus)
Viruses; ssDNA viruses; Parvoviridae; Densovirinae; Itera
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     InterPro; IPR001257; Parvo_NS1.
Pfam; PF01057; Parvo_NS1; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      EMBL; M15123; AAA67698.1; -. PIR; C26796; VCPVF2.
                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                        Nonstructural
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 869
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            -!- SIMILARITY: BELONGS TO THE PARVOVIRUSES NONCAPSID PROTEIN FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            276
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DSRIALGELQKQRKMNL
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                                                                                                                                                                                                                                                                                                                                            HIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSGVEKACFMSHAVLWEQA
                                                                                                                          ASNNLNAFVDYMGYNYFGEQKAPQSMPKFMIGFVNIRNE-
                                                                                                                                                                                        TPLAAPTNIMT----PIPGLEN-----GYFMSNDQIRERRDLTTSVPPDALTATKLNQS
                                                                                                                                                                                                                    ---VRPDKVLNYENRSFPLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKA-----
                                                                                                                                                                                                                                                   VDYSLPY---FENNVPKDVGIYDYVDIKNGTTAYGKCWEKRFKPTNGLLYAESTLKGNVV
                                                                                                                                                                                                                                                                                  LDEGLPYIAVFEDDVLLGEGAEQFL-----AEDTWLEERFDKDSAFIVRLETMFAKVI 129
                                                              KTRIRLTGLQSTREWVARTDRIPPQYFTSQYTQFRYPNINDTPLLRSLGTFKLPTKRPGM
                                                                                                                                                                                                                                                                                                                                                                             61;
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                                                                                                                                                      -----VDLMMFTYFFDK---EGMPVYQVSPALCTQELHYAKFLSQNSMLG-----
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                                                                                           SDLEKDREQGRRHRRSLKVMF - - - - -
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885 AA; 1
                             -RMERQRQAEL
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                                                                                                                                                                                                                                                                                                                                                                                                                                         100958 MW;
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                                                                                                                                                                                                                                                                                                                                                                                          Score 88.5;
Pred. No. 9
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5
                                                                                           ·----DLKRALGKFGREKKK---
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RESULT 15
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NR HSSP; P25912; 1HLO.

RHSSP; P25912; 1HLD.

RICETPO; IPRO01092; HLH_basic.

DR InterPro; IPRO02418; TF_Myc.

DR Ffam; PF01016; HLH; 1.

DR Pfam; PF01056; Myc_N_term; 1.

DR Pfam; PF01056; Myc_N_term; 1.

DR PRINTS; PR00044; LEUZIPPRMYC.

DR PRINTS; SM00353; HLH; 1.

DR PROSITE; PS00038; HLH_1; 1.

DR PROSITE; PS00038; HLH_1; 1.

DR PROSITE; PS00038; HLH_2; 1.

RW Nuclear protein; DNA-binding; Proto-oncogene; Phosphorylation.

KW Nuclear protein; DNA-binding; Proto-oncogene; Phosphorylation.

DNA_BIND 360 399

HELLX LOOP-HELIX MOTIF (BY SIMILARITY).
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                   Matches
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DOMAIN
DOMAIN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             gene family.";
Proc. Natl. Acad. Sci. U.S.A. 86:9144-9148(1989).
-!- FUNCTION: HAS A SUPPRESSIVE EFFECT ON TUMORIGENICITY (IN VITRO).
-!- SUBUNIT: EFFICIENT DNA BINDING REQUIRES DIMERIZATION WITH ANOTHER
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MYCS.
Rattus norvegicus (Rat).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              MOD_RES
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   <del>-</del>
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Nishimura S., Kuchino
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE=90083224;
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                       144 PLLESEHCGTAGYIISREAMRFFLDRFAVLPPERIKAVDLMMFTYFFDKEGMPVYQ---- 199
                                                                                                                                                                                                     157
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TRANSCRIPTION FACTORS. BHLH-ZIP SUBFAMILY.
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                                                                                                                                                                                                                                                                                                                 DIFGLKGLSGSSSNPVVLQDCMWSGFSSREKPETVVSEKLPGGCGSLAVGAGTLVPGAAA 156
                                                                                                                                                                                                                                                                                                                                                                       DTFGSRGI-----PFQFFDALMPS----ERLEQAMAE-----LVPGLSA 54
                                                                                   ISLGDHQGLSSSLEDFLSNSGYVEE--GGEEIYVVMLGETQFSKTVTKLPTAAHSENAAL 273
                                                                                                                                                                                                  ATSAGHARSGTAGVGRRKAAWLTELSHLDSEC-VDSAVIFPANKRESMPVATIPASAGAA 215
                                                                                                                                                                                                                                                                 -----H----
                                                                                                                                      --FEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVRL-ETMFAKVIVRPDKVLNYENRSF 143
                                                                                                                                                                                                                                                                                                                                                                                                                                   65;
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398
36
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419
36
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                                                                                                                                                                                                                                                                                                                                                                                                                                   49;
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred.
                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 87.5; DB 1; Pred. No. 4.6;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PHOSPHORYLATION (BY TYR-KINASES)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               (BY SIMILARITY).
1E79FF90747FD0FA CRC64;
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Mismatches 111; Indels 129;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Length 429;
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Search completed: December 2, 2002, 11:56:31 Job time: 8.8146 secs

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Minimum
Maximum
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Maximum Match 100%
Listing first 45 summaries
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Scoring table:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence:
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SP_Archea:*

Sp_bacter:*

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Sp_bacter:*

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Sp_tung1:*

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Sp_invert

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Sp_invert
Sp_mamma'
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Sp_mac:*
Sp_phac
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1440
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Copyright (c) 1993 - 2002 Compugen Ltd.
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sp_bacteriap:*
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       280
280
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283
       116
  Q93PR7
Q93EVD3
Q93EK4
Q93PR9
Q93EK5
Q9GGN1
Q9EVD4
Q9EVD4
Q9EVD4
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Q9RGM8
P96947
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Ogrex4 neisseria g

Ogrgm8 neisseria m

P96947 neisseria m

Ogspr7 neisseria m

Ogspr8 neisseria m

Ogsek4 neisseria m

Ogspr9 neisseria m

Ogspr9 neisseria m

Ogspr9 neisseria m

Ogspr1 neisseria m

Ogrgn1 neisseria s

Ogerku0 haemophilus

Ogspr8 haemophilus

Ogspr8 haemophilus

Ogspr8 haemophilus

Ogsp8 haemophilus

Ogsp8 haemophilus
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Q9alt2 campylobact Q9kal7 bacillus ha	0	257 2	o o o o	96.5 95.5	44 4 5
Q9m0g3 arabidopsis O9svt9 arabidopsis	10 09M0G3	839 1	6.7	97 97	2 4
Q9zll6 helicobacte		444]	. 7	97	41
Q9rhg8 helicobacte	2 Q9RHG8	273 2	. 7	97	40
Q47960 haemophilus	2 Q47960	224 2	œ	97.5	39
	16 Q8YG36	721 1	&	98.5	38
Q9zl17 helicobact	16 Q9ZL17	273 1	9	99	37
006023 haemophilus	2 006023	287 2	.9	99.5	36
Q9x6q5 actinobacil	2 Q9x6Q5	224 2	'n	102	35
O25500 helicobacte		273]	7.2	104	34
Q9cnc3 pasteurella		261 1	7.6	109	S S
Q9h6f1 homo sapien	1 Q9H6F1	243 4	7.7	111	32
	1 Q8WUI9	231 4	7.7	111	31
Q9alz3 campylobact	Q9ALZ3	254 2	&	112	30
Q9z117 helicobacte	16 Q9ZLL7	332 1	. 4	120.5	29
	1 060327	738 4	. 4	121	28
Q937y0 edwardsiell	2 Q937Y0	261 2	თ	124.5	27
Q8rjm1 vibrio chol	2 Q8RJM1	207 2	8.7	125.5	26
	L Q9UMW5	517 4	.6	128.5	25
Q9p226 homo sapien	1 Q9P226	560 4	.0	129.5	24
Q48023 haemophilus	Q48023	247 2	'n	131	23
	2 Q9ZIS2	257 2	9.3	134	22
Q9aly2 campylobact	2 Q9ALY2	251 2	ښ س	134	21
Q8rjl2 vibrio chol	2 Q8RJL2	230 2	. 7	139	20
Q9vmq6 drosophila	5 Q9VMQ6	128 5		144	19
Q8rjk5 vibrio chol	Q8RJK5	242 2	11.9	171.5	18
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Harvey H.A., Porat N., Campbell C.A., Je
Phillips N.J., Apicella M.A., Balke M.S.
"Gonococcal lipooligosaccharide is a lig
receptor on human sperm.";
Mol. Microbiol. 36:1059-1070(2000).
EMBL; AF121135; AAF14363.1; -.
Bacteria;
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01-DEC-2001 (TrEMBLrel. 19, L
01-MAR-2002 (TrEMBLrel. 20, I
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EMBL; U65788; AAB48387.1; -.
InterPro; IPR002654; GT_25.
Pfam; PF01755; Glyco_transf_25; 1.

Transferase.
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"Characterization of lipooligosaccharide struc
gonorrhoeae PID2.";
Submitted (OCT-2000) to the EMBL/GenBank/DDBJ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Neisseria gonorrhoeae.
Bacteria; Proteobacteria;
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"The genetic basis of the phase variation
                                                                                                                                                                              Transferase.
SEQUENCE 280 AA;
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                                                                                      Score 1344; DB 2;
pred. No. 1.9e-111;
5; Mismatches 13;
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Pred. No. 1.5e-111;
Pred. No. 1.5e-111;
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01-MAR-2001 (TremBLrel.
01-MAR-2002 (TremBLrel.
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01-MAR-2001
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"Analysis of lipooligosaccharide biosynthesis
J. Bacteriol. 183:934-941(2001).
EMBL; AF244672; AAG09766.1;
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Bacteria; Proteobacteria;
NCBI_TaxID=28449;
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PF01755; Glyco_transf_25; 1.
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Last sequence update)
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No. 2.2e-106;
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Bacteria; Proteobacteria;
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Q1-DEC-2001
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"Genetic Analysis of Conservation and Variation of Lipooligosaccharide Expression in Two L8-Immunotype Strains of Neisseria meningitidis.";

FEMS Microbiol. Lett. 203:173-177(2001).

EMBL; AF355193; AAL12841.;

InterPro; IPR002654; GT_25.

Pfam; PF01755; Glyco_transf_25; 1.

SEQUENCE 275'AA; 31577 MW; A73037E0625EE7B3 CRC64;
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Q9RGN1; Q9RGN1; 01-MAY-2000 01-MAY-2000 01-MAR-2002

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SERCIES-N.meningitidis (serogroup A);

SERCIES-N.meningitidis (serogroup A);

STRAIN-Z2491 / SEROGROUP A / SEROTYPE 4A;

CSTRAIN-Z2491 / SEROGROUP A / SEROTYPE 4A;

MEDLINE-2022556; PubMed-10761919;

MEDLINE-2022566; PubMed-10761919;

MEDLINE-2022556; PubMed-10761919;

MEDLINE-202256; PubMed-10761919;

MEDLINE-2022556; PubMed-10761919;

MEDLINE
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Q9JW65;
01-OCT-2000
01-OCT-2000
01-MAR-2002
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SEQUENCE
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MEDLINE=21467954; PubMed=1183844;
Zhu P., Klutch M.J., Tsai C.-M.;
"Genetic Analysis of Conservation and Variation of Lipooligosaccharide
"Genetic Analysis of Conservation and Variation of Lipooligosaccharide
Expression in Two L8-Immunotype Strains of Neisseria meningitidis.";
FEMS Microbiol. Lett. 203:173-177(2001).
EMBL; AL162753; CAB83819.1; -.
EMBL; AF355194; AAL12844.1; -.
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01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
01-MAR-2002 (TrEMBLrel. 20, Last annotation update)
Lacto-N-neotetraose biosynthesis glycosyl tranferase
LGTB2 OR NMA0527 OR LGTH.
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Pfam; PF01755; Glyco_transf_25;
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Neisseria meningitidis.
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Best Local Sim
Matches 194;
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Best Local Similarity
Matches 198; Conser
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Bacteria; Proteo
NCBI_TaxID=485;
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01-MAR-2001 (TrEMBLrel.
01-MAR-2001 (TrEMBLrel.
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Pfam; PF01755; Glyco_transf_25;
Transferase.
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                                                                                                                                                           Transferase.
275 AA;
                                                                                                                                                                                                 InterPro; IPR002654; GT_25.
Pfam; PF01755; Glyco_transf_25; 1.
                                                                                                                                                                                                                            MEDLINE-21142520; PubMed=11208792;
Arking D., Tong Y., Stein D.C.;
"Analysis of lipooligosaccharide biosynthesis
J. Bacteriol. 183:934-941(2001).
EMBL; AF240672; AAG09765.1; -.
                                                                                                                                                                                                                                                                                                                                                                 Neisseria subflava.
Bacteria; Proteobacteria;
                                                                                                                                                                                                                                                                                                                                                                                                                 Galactosyl transferase
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EMBL; AF121135; AAF14360.1; -.
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 VEKACFMSHAVLWEQALDEGLPYIAVFEDDVLLGEGAEQFLAEDTWLEERFDKDSAFIVR
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                                  MQNHVISLASAAERRAHITDTFGVRGIPFQFFDALMPSERLEQVMAELVPGLSAHPYLSG
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Proteobacteria;
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Last sequence update)
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                                                                                                Score 984; DB 2;
Pred. No. 1.8e-79;
1; Mismatches 46
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Pred. No. 4.9e-81;
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Q9L7A4;
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Q1-OCT-2000
Q1-MAR-2002
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Q8RKU0;
01-JUN-2002 (TrEMBLrel. 21,
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01-JUN-2002 (TrEMBLrel. 21,
Galactosyltransferase
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              factor in strains of non-typeable Haemophilus otitis medi.";
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"Identification of LOS biosynthesis gen
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aemophilus influenzae
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6lycosyltransferase)
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WW Y. McQuiston J.H., Cox A., Pack T.D., Inzana T.J.;
"Molecular cloning and mutagenesis of a DNA locus involved lipooligosaccharide biosynthesis in Haemophilus somnus.";
Infect. Immun. 68:310-319(2000).
EMBL; AF096997; AAC83803.1; -.
InterPro; IPR002654; GT_25.
Pfam; PF01755; Glyco_transf_25; 1.
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                                               Transferase.
SEQUENCE 282
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Bacteria; Proteobacteria;
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B., Tarantino L.,
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EMBL; AE006155; AAK03225.1; -.

InterPro; IPR002654; GT_25.

Pfam; PP01755; Glyco_transf_25; 1.

Hypothetical protein; Complete proteome.

SEQUENCE 208 AA; 24649 MW; 29625BA115E4047A CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MQNHVISLASAAERRAHIADTFGSRGIPFQFFDALMPSERLEQAMAELVPGLSAHPYLSG
-KKTWREKVYHIFTKPQRMLKKRKERAEK
                                                                                                                                        FDKEGMPVYQVSPALCTQELHYAKFLSQN-SMLGSDLEKDREQGRRHRRSLKVMFDLKRA
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                                                                                           LAGEELMVYQLSPALCIQELQ----LNENESLLDSQLESERKNYRLAEKARK---
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RERESKNIKKAKKILWRSISKEIGRFRRRIFER
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               KLKSCFMSHVLLWQKCVDENLPFIAIFEDDIFLSSVANKFLSEYDWLKERLAFNQYFILR
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          MENYVISLKSAVDRRQHIEKEFSQQHIPYTFFDAFQLNEENKHILQHYVPALS-KSNLAN 59
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               REQGRRHRRSLKVMFDLKRALGK-FGREKKKRMER 262
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                                                                                                                                                                                                                                                                                                                                                                                                               Similarity
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40.7%; Pred.
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5; Mismatches
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  195
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No. 2.3e-23;
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